SECTION 7

Part B

4WD Front Axle

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7B - 1 SPECIFICATION - FRONT AXLE:

Axle type - MF2605/2615 tractors	...	Offset driven banjo type axle
Camber angle	...	1.5°
Toe-in	...	0 - 5 mm (0 - 0.196 inch).
Axle reduction ratio - crownwheel and pinion	...	3.182 : 1
Epicyclic reduction ratio	...	3.882 : 1
Overall reduction unit	...	12.35 : 1
Crown wheel and pinion backlash	...	0.006 - 0.010 inch (0.15 to 0.25 mm).
Deflection of left-hand bearing cap	...	0.002 - 0.004 inch (0.05 to 0.1 mm)
King pin clearance	...	0.006 inch (0.15 mm) max

Oil capacity:

Hub - each side	...	0.132 gal + 0.132 gal (0.5 lts + 0.5 lts) (Both left and right hand side).
Axle	...	1.452 gal (5.5 lts).

Bolt torques

Track rod locknuts	...	81 - 88 lbf.ft (110 - 120 Nm)
Steering cylinder ball joints	...	169 - 184 lbf.ft (230 - 250 Nm)
Ball joint nuts	...	114 - 125 lbf.ft (155 - 170 Nm)
Wheel nuts	...	199 lbf.ft (270 Nm)
Planetary carrier cap screws	...	44 - 51 lbf.ft (60 - 70 Nm).
Hub retaining nuts	...	250 - 258 lbf.ft (340 - 350 Nm).
Pinion nut	...	66 - 73 lbf.ft (90 - 100 Nm)
Differential case bolts	...	59 - 66 lbf.ft (80 - 90 Nm).
Differential bearing cap bolts	...	88 - 95 lbf.ft (120 - 130 Nm).
Steering ram cap screws	...	81 - 88 lbf.ft (110 - 120 Nm).
Bearing lock tab bolt	...	11 - 19 lbf.ft (16 - 26 Nm).
King pin mounting bolts	...	44 - 51 lbf.ft (60 - 70 Nm).
Differential carrier to axle housing	...	95 - 103 lbf.ft (130 - 140 Nm).
Axle housing filler plug	...	22 - 29 lbf.ft (30 - 40 Nm)
Planetary carrier filler plug	...	22 - 29 lbf.ft (30 - 40 Nm)
Magnetic drain plug axle housing	...	36 - 44 lbf.ft (50 - 60 Nm)
Lock nut axle stopper bolt	...	88 - 95 lbf.ft (120 - 130 Nm)

Special Tools

SER / 300	...	Pusher to press Bush in Diffcase LH/RH
SER / 302	...	Pusher to press Cone Bearing in Diffcase LH/RH
SER / 303	...	Pusher to press Crown Wheel in Diffcase
SER / 304	...	Press Cone Bearing in Pinion
SER / 305	...	Pusher to press Cup Bearing Inner in Diff carrier
SER / 306	...	Pusher to press Cup Bearing Outer in Diff carrier
SER / 307	...	Pusher to press Oil Seal in Diff Carrier
SER / 308	...	Pusher to press Needle Roller Bearing in Swivel Housing (Manual Pressing)
SER / 309	...	Pusher to press Cone Bearing in Swivel Housing
SER / 310	...	Pusher to press Oil Seal in Swivel Housing (Mating with Wheel Hub) Big
SER / 311	...	Pusher to press Cup Bearing Inner in Wheel Hub
SER / 314	...	Pusher to press Cone Bearing in Annular Gear
SER / 315	...	Tighten and Torque Lock Nut
SER / 316	...	Pusher to press shaft pinion planetary
SER / 317	...	Pusher to press Needle roller bearing in drive shaft bores of axle housing
SER / 318	...	Pusher to press Oil seal in drive shaft bores of axle housing
SER / 319	...	Pusher to press Cup Bearing in King Pin Bores
SER / 320	...	Pusher to press Oil Seal in King Pin Bores
SER / 352	...	Gland assembly tool
SER / 353	...	Rod mounting bell
SER / 354	...	Rod seal mounting bell
SER / 355	...	Piston seal pusher tool
SER / 356	...	Piston seal calibration tool
SER / 357	...	Piston seal pusher
SER / 358	...	Piston seal loader
SER / 359	...	Piston Seal resizer
MF 485 / 1	...	Pivot pin seal installer
MF 444	...	Axle pivot pin remover
SER 360	...	Drive shaft end float checking tool

Refer table for snap on tools for removal of bearing cup, cones and needle roller bearing etc...

S.NO	APPLICATION	SPX - OTC CATALOG PART NUMBER REFERENCE	PULLER DESCRIPTION	OTC Tool Page No.
1	Removal of cup from diff carrier	1178	Slide hammer puller set. Can only be used with slide hammer	210
2	Removal of cup from wheel hub	1158	Slide hammer puller. Can only be used with slide hammer	207
3	Removal of cup from swivel housing			
4	Removal of cup from annular ring	1045	17-1/2 ton 3 jaw puller, 14-1/2" max reach, 14" max spread	202
5	Removal of cone bearing in differential case right-hand			
6	Removal of cone bearing in differential case left-hand			
7	Removal of cone from bevel pinion			
8	Removal of cup from axle housing	1176	Slide hammer puller set. Can only be used with slide hammer	207, 210, 214, 216
9	Removal of needle roller bearing from swivel housing			
10	Removal of cone from bevel pinion small end	1043	17-1/2 ton 2 jaw puller, 14-1/2" max reach, 14" max spread	202

7B - 2 General description.

The axle described in this manual designed and manufactured following the client requests, consists of a beam casing housing the differential and a wheel hub unit at each end.

The differential, type “open”, is supported by two bearings mounted on a suitable structure allowing the bevel gear set to be adjusted.

The ring bevel gear is adjusted by means of ring nuts located opposite each other.

The position of the bevel pinion, supported by two bearings, is adjusted by inserting adjusting shims.

The drive torque is transmitted from differential side gears to planetary sun gears through drive shaft.

The drive shaft is supported at axle housing and swivel housing by needle roller bearings with proper seals in position.

The wheel hubs containing the epicyclic reduction gears are supported by two tapered roller bearings. The wheels ends are steered by hydrostatic power steering.

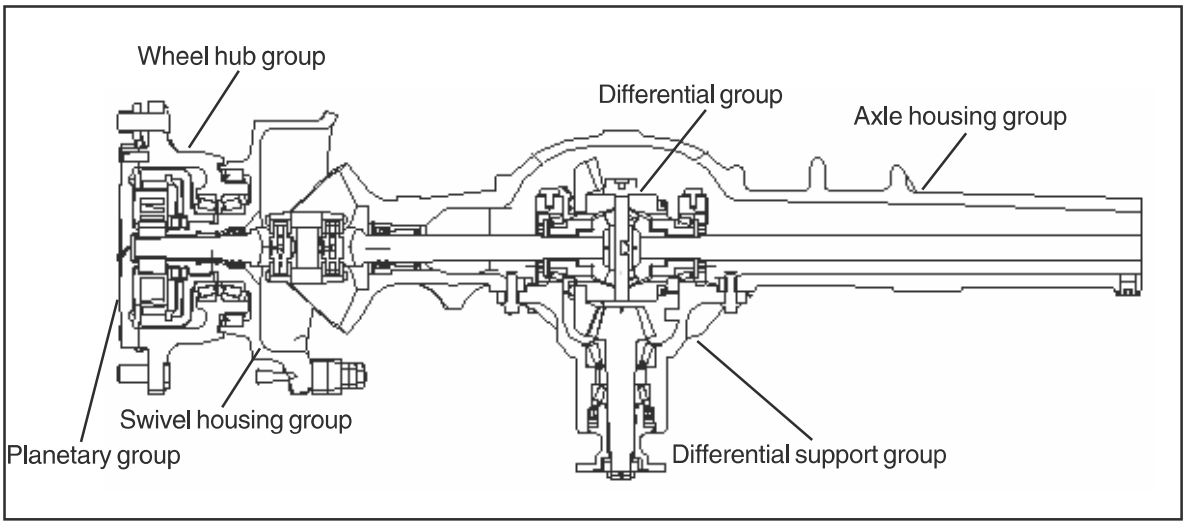


Fig 1

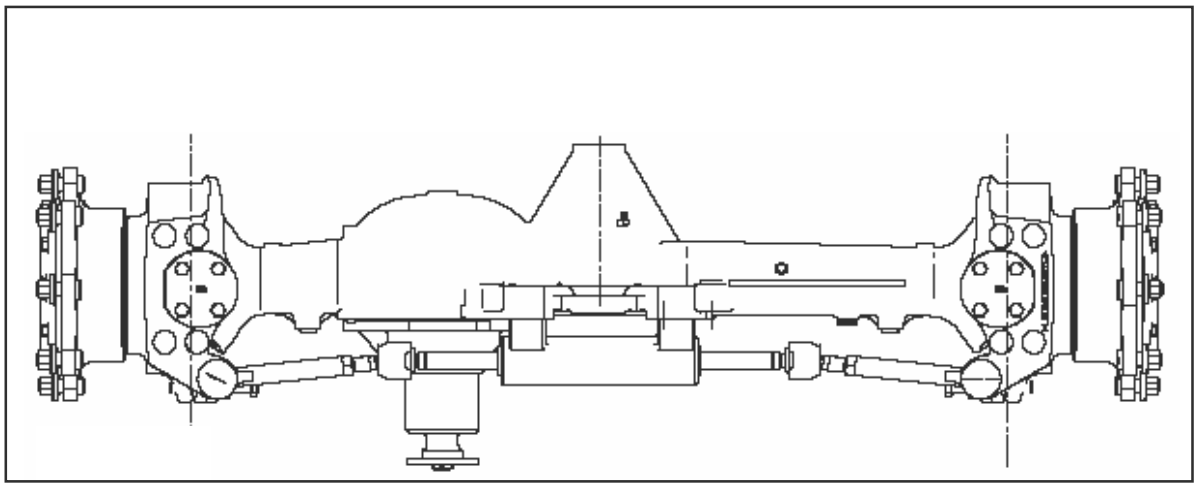


Fig 1a Front axle top view

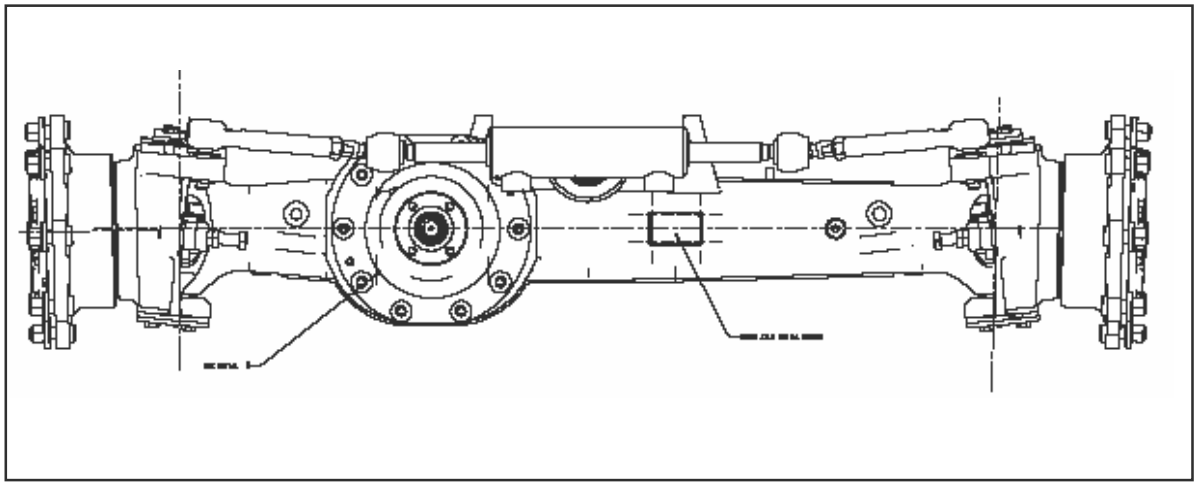


Fig 1b Front axle Front view

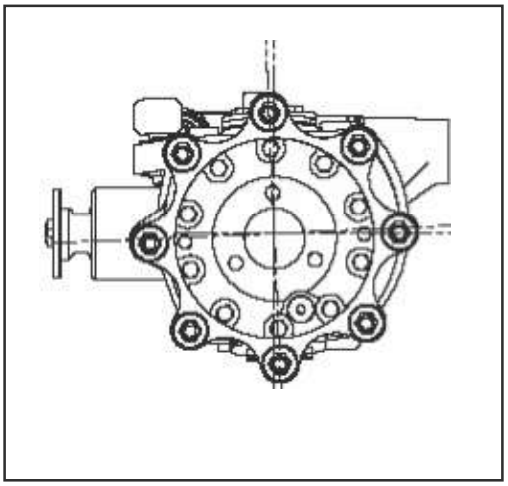


Fig 1c Front axle Side view

4WD LUBRICATION AND GREASING

PERIODICAL CHECKS :

In the 4WD front axle, lubricant should be maintained up to the level of plug (1 & 4 in Fig. 1d). If not, top up with recommended grade of oil.

Low oil level could be an indication of a leak and should be repaired in order to prevent damage to internal mechanical parts.

Loosen and remove the drain plug (2 in Fig. 1d) for oil draining.

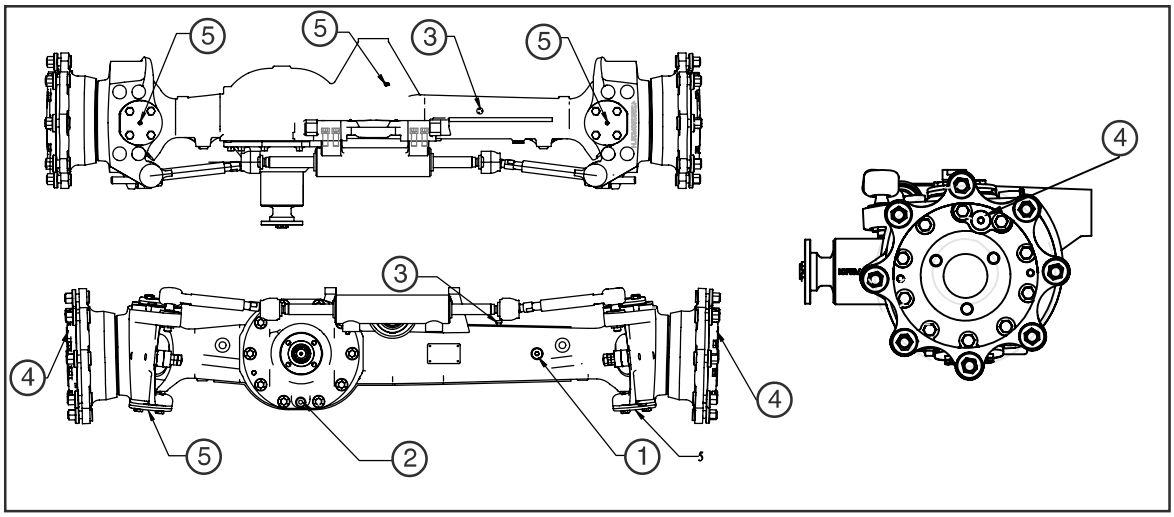


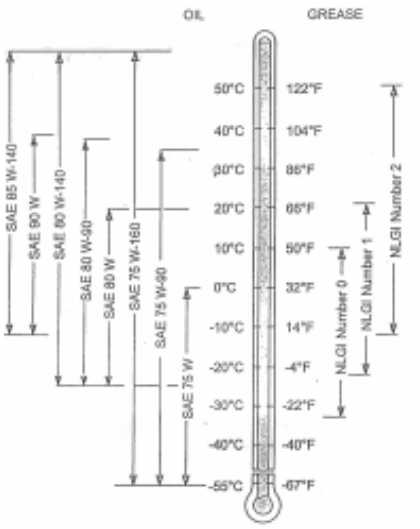
Fig. 1d

(1) Differential oil filling and level plug, (2) Differential oil drain, (3) Oil breather,
(4) Epicyclic reduction oil fill / Drain and level, (5) Greasing point.

PERIODIC LUBRICATION TABLE

OIL CHANGE	*First Time 150–200 Hrs*	*Seasonally or every 1000 Operating hrs whichever comes first*
LUBRICATION WORKS	—	Monthly
CHECK AND ADJUST OIL LEVEL	*First Time 150 – 200 Hrs*	Monthly
CLEAN MAGNETIC OIL DRAIN PLUG	First Time 150 – 200 Hrs	Every Oil Change
CLEAN OIL BREATHER	—	Monthly
GREASING	*First Time 150 – 200 Hrs*	Monthly

LUBRICATION/GREASING GRADES AND APPLICATION RANGE



Remarks : ▢ = operation to be performed by vehicle's manufacturer authorized personnel only

▢ = operation to be performed by trained personnel only

FRONT AXLE 4WD

Steps to be followed for checking the oil level in front axle differential.

Move the tractor onto level ground. Remove the filler/ level plug (Fig. 1e) on the axle housing. Using a 8 mm hexagon key remove the plug. The oil must be level with the bottom edge of the hole. If not, add oil of the correct grade.

Steps to be followed for changing oil

1. With the tractor standing on level ground, place a drain pan beneath the front axle.
2. Remove the drain plug (Fig. 1f) and the filler/level plug (Fig 1e) and allow the oil to drain, preferably while the oil is still warm.
3. Refit the drain plug, then refill the front axle with an approved oil up to the bottom edge of the filler/level plug. Refit the filler level plug.

***NOTE** : Time should be allowed for the oil to settle inside the front axle before rechecking the level.*

Steps to be followed for checking the oil level in front axle epicyclic hubs

Move the tractor onto level ground. Turn the wheel so that the plug (Fig. 1g) is at the three o' clock position.

Using a 8 mm hexagon key remove the plug. The oil must be level with the bottom edge of the hole. Add oil of the correct grade if the oil level is low.

Steps to be followed for draining the oil level in front axle epicyclic hubs

1. Put the tractor on level ground and turn the wheel until plug (Fig. 1h) is in the 6 o' clock position.
2. Remove the plug and allow the oil to drain, preferably after a period of work while the oil is still warm.
3. When the oil has fully drained, rotate the hub until the plug is in the three o' clock position.

   Refill with recommended grade of oil up to the level of plug opening and refit the filler level plug.

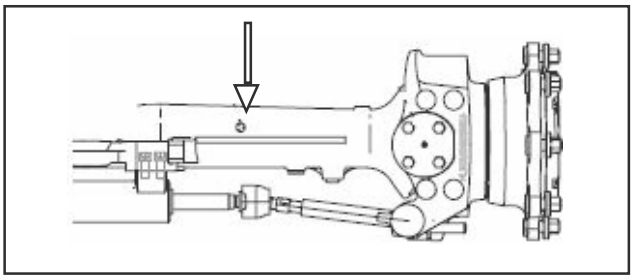


Fig 1e

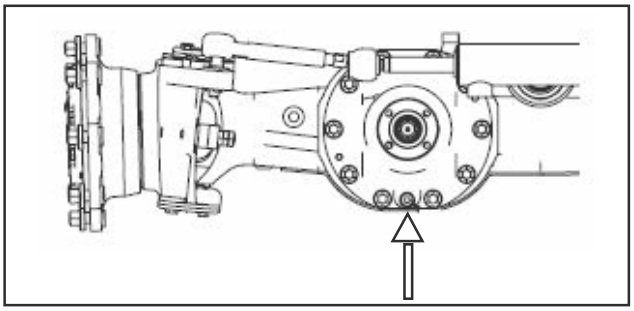


Fig 1f

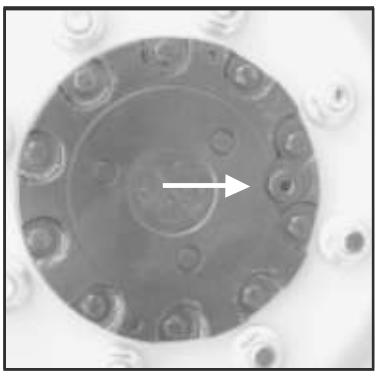


Fig. 1g

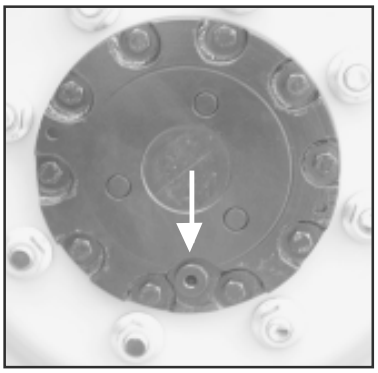


Fig. 1h

FRONT AXLE 4WD

GREASE LUBRICATION – *Grease the fittings illustrated below with a good quality lithium based grease*

FRONT AXLE PROPELLER SHAFT(Fig.1i)

Grease the Propeller shaft every 100 hours.

Lubricate both the universal joints and the sliding joint with grease.

Loosen the clips and slide back the cover (1).

Grease the universal joint (2).

Remove the small plug (3) in the sliding coupling and replace it with a grease nipple with a 1/4 in UNF thread. Grease the coupling.

Replace the plug and guard, then repeat the operation for the universal joint at the front of the shaft.

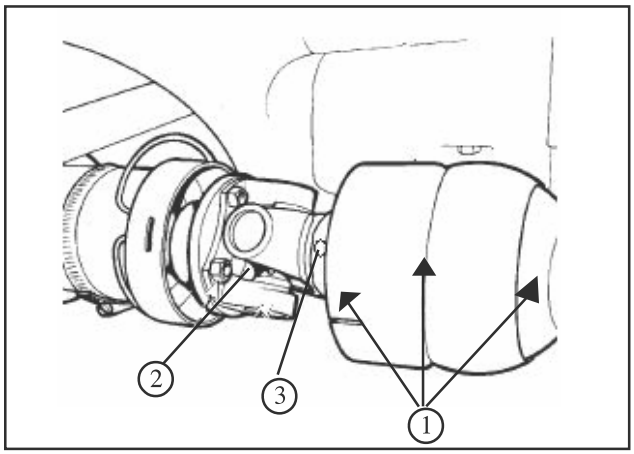


Fig.1i

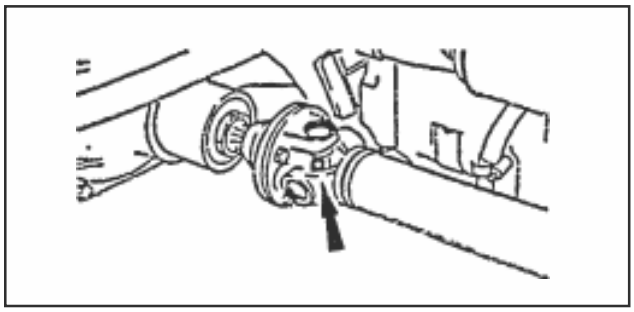


Fig. 1j

PROPELLER SHAFT FRONT (Fig. 1j)

Slide back the propeller shaft guard.

Grease every 100 hours – 1 point.

After greasing, the guard must be moved back to its original position.

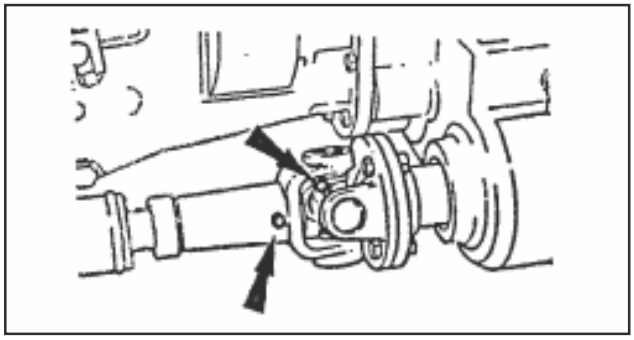


Fig.1k

PROPELLER SHAFT REAR (Fig. 1k)

Slide back the propeller shaft guard.

Grease every 100 hours – 2 points.

After greasing the guard has to be moved back to position.

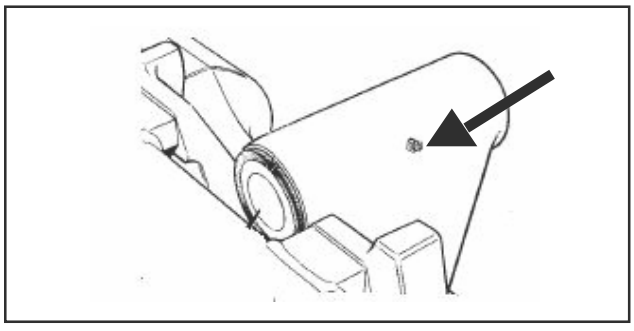


Fig. 1l

FRONT AXLE PIVOT PIN (Fig. 1l)

Grease every 100 hours – 1 point.

Grease : MF approved grease (Part no.- 3620209M2) or equivalent.

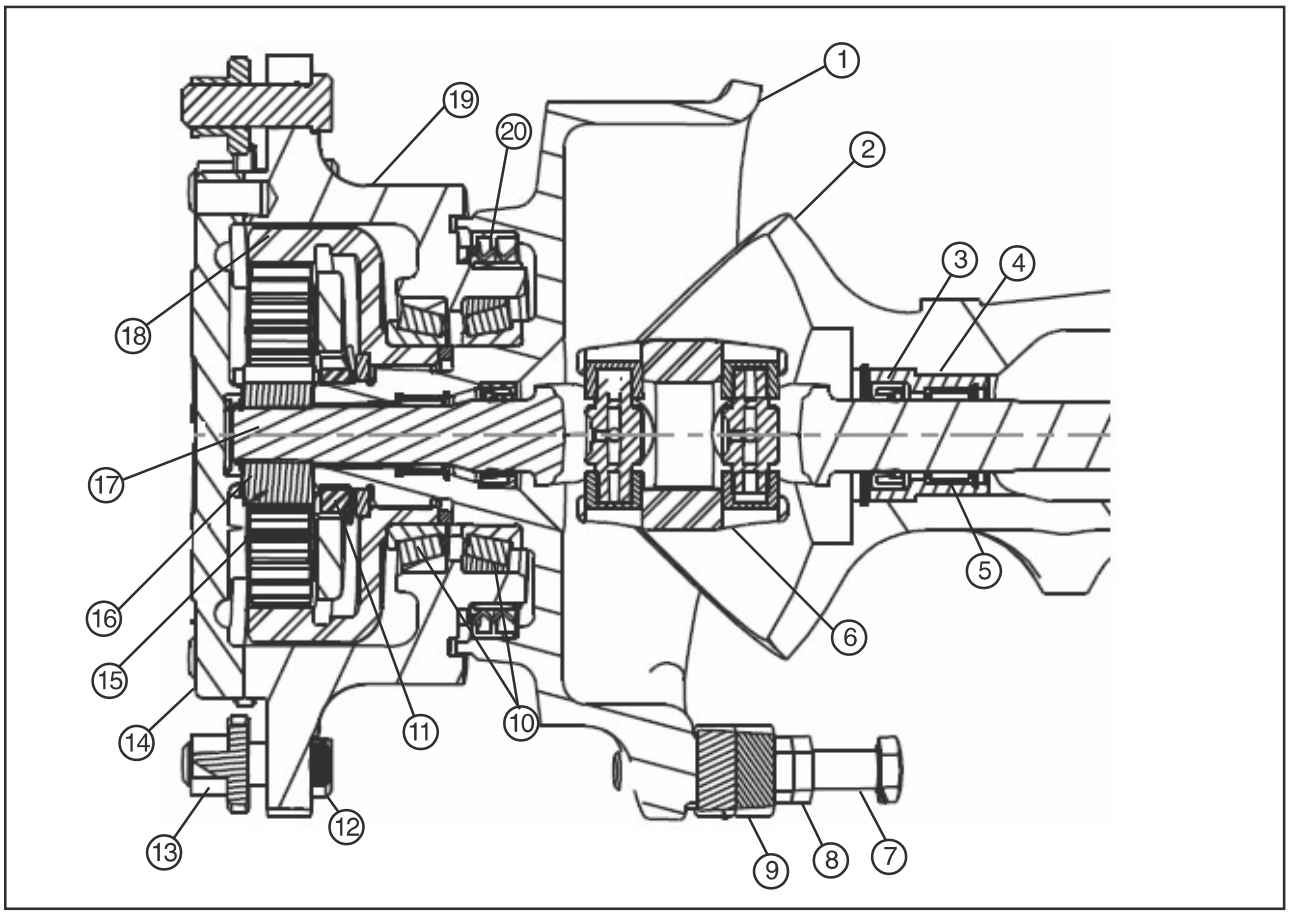


Fig 2 Four wheel drive Front axle (Wheel end cut section)

1. Swivel housing.
2. Axle housing.
3. Oil seal.
4. Sleeve.
5. Needle roller bearing.
6. Universal joint.
7. Axle stopper bolt.
8. Nut.
9. Spacer.
10. Taper roller bearing.
11. Lock nut.
12. Bolt.
13. Nut.
14. Planetary carrier.
15. Planetary gear.
16. Sun gear.
17. Drive shaft.
18. Annular ring gear.
19. Wheel hub.
20. Oil seal.

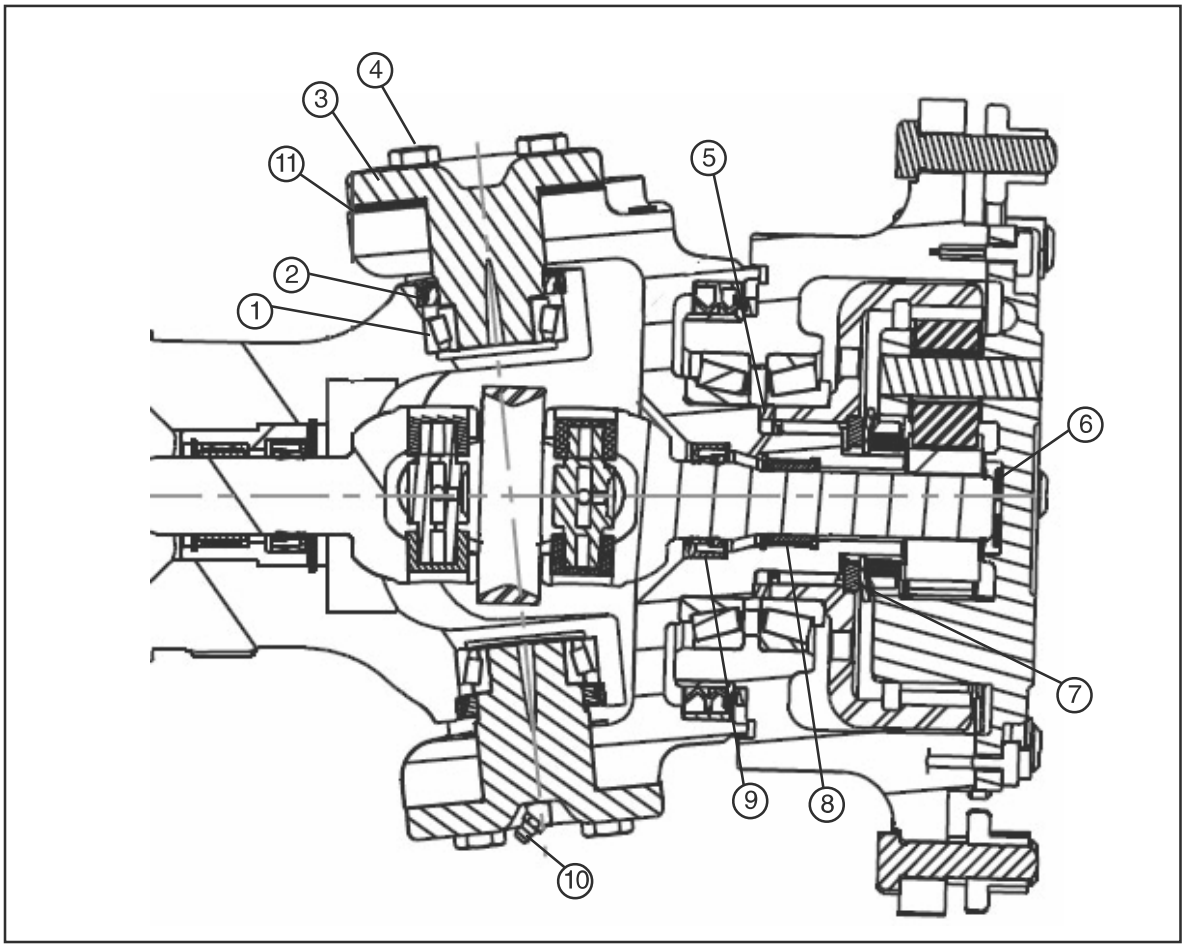


Fig 2a Four wheel drive Front axle (Wheel end cut section)

1. Taper roller bearing.
2. Oil seal
3. King pin.
4. Bolts.
5. Hub spacer.
6. Thrust washer.
7. Spacer.
8. Needle roller bearing .
9. Oil seal.
10. Grease nipple.
11. King pin shim

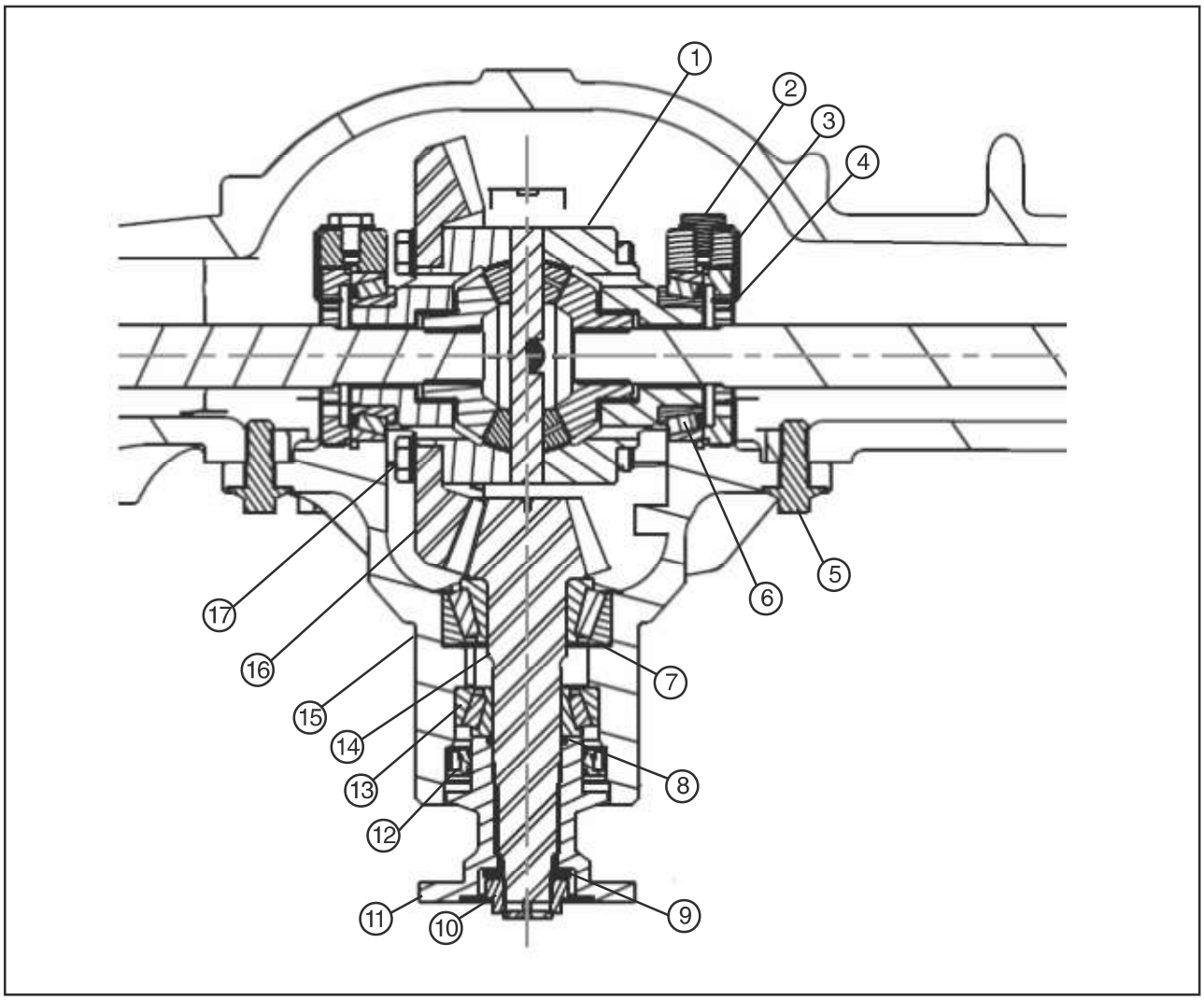


Fig 3 Four wheel drive Front axle (Differential cut section)

1. Differential case assembly.
2. Bolt.
3. Locking plate.
4. Ring nut.
5. Differential carrier bolt.
6. Taper roller bearing.
7. Shim.
8. 'O' ring.
9. Washer.
10. Castle nut.
11. End flange.
12. Oil seal.
13. Taper roller bearing.
14. Pinion.
15. Differential carrier.
16. Crown wheel.
17. Differential case bolts

7B - 3 WHEEL ALIGNMENT AND STEERING STOPS

Adjust

Procedure - wheel alignment

1. Drive the tractor onto firm level ground and put the front wheels in the straight ahead position.
2. Check the wheel toe-in measured on the centre line of the axle at the tire. Distance 'A' must be 0 - 0.196 inch (0 - 5 mm) greater than distance 'B'.
3. If adjustment is necessary, slacken the locknut (1) on the track rod on both sides.

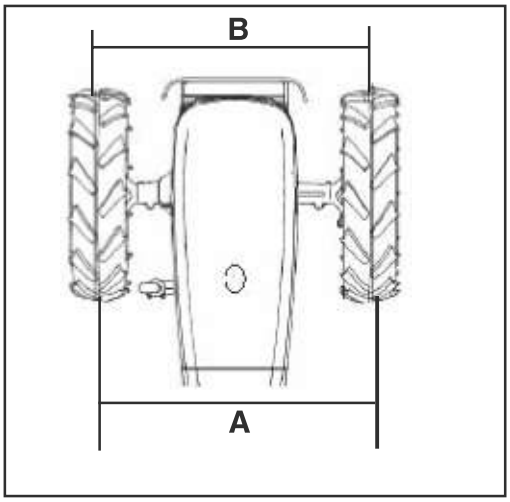


Fig 4

4. Rotate the inner steering ball joint (2) to either increase or decrease the track rod length to obtain the correct toe in.
5. Apply Massey Ferguson Stud lock (Loctite 118) and tighten the track rod lock-nut to a torque of 81 - 88 lbf.ft (110 - 120 Nm).

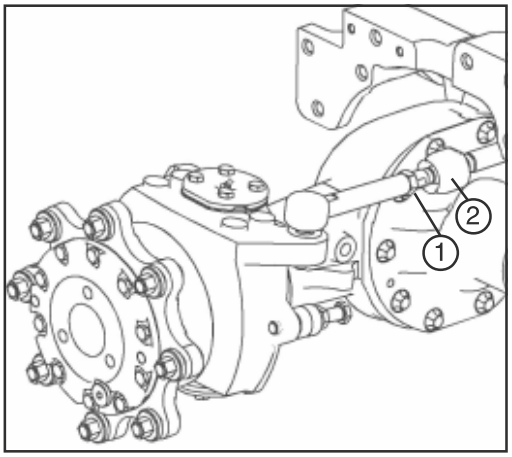


Fig 5

Procedure - steering stops

CAUTION: ***At the smaller track settings, a foul condition may occur between the tire and tractor or loader, if fitted, when the wheels are turned to the full lock position. To avoid this condition you must check by turning the wheels to full lock and adjusting the steering stops as necessary.***

6. Place the jack under the engine sump and raise the tractor enough to allow the axle to swing from one stop to the other.
7. Turn the front wheels to full lock and check that the inside edge of the tire does not foul the tractor.
8. Carry out the same check on the other lock.
9. If necessary, adjust the length of the steering stops (1) on both sides so that a foul condition will not occur. Tighten the lock-nuts (2) to a torque of 88 - 95 lbf.ft (120 - 130 Nm) after adjustment.

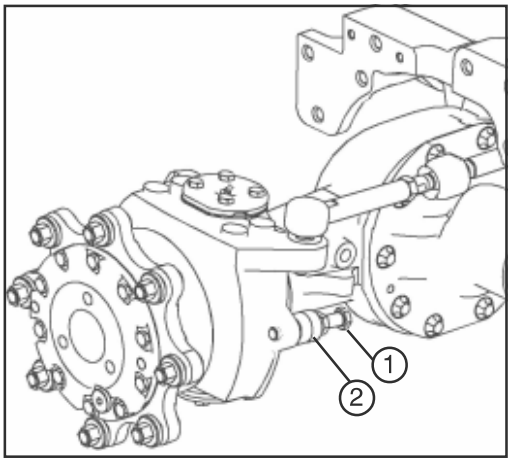


Fig 6

7B - 4 TRACK ROD AND BALL JOINT

Removal and refitment

Removal

1. Remove the nut from the ball joint.
2. Remove the ball joint from the housing by using an extractor or by striking the housing with a hammer adjacent to the ball joint to release the taper.
3. Slacken the lock-nut and unscrew the ball joint from the track rod.
4. To remove the inner joint, hold the end of the steering ram piston rod with a spanner and unscrew the joint.

Refitment

5. Reverse procedures 1 to 4 except:

   a. Apply Massey Ferguson Stud lock (Loctite 118) to the threads of inner joint and screw it into the end of the steering ram piston rod.

   b.Set the wheel alignment as described in operation 7B - 3.

   c. Tighten the track rod lock-nut to a torque of 81 - 88 lbf.ft (110 - 120 Nm).

   d. Apply loctite 118 to the thread and tighten the ball joint nut to a torque of 114 - 125 lbf.ft (155 - 170 Nm).

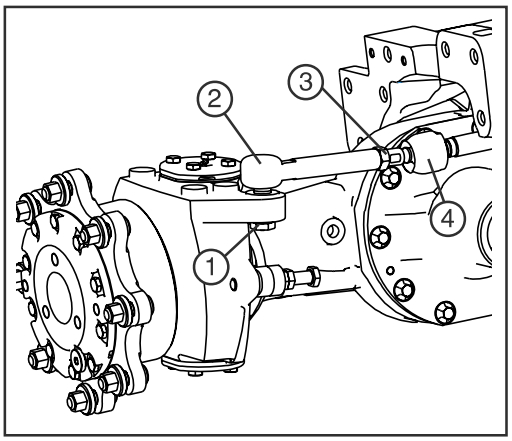


Fig 7

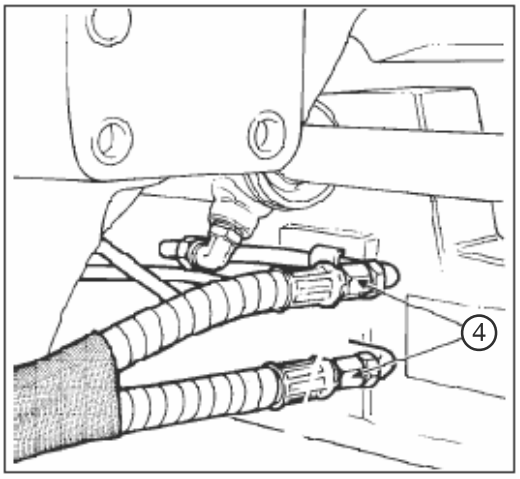


Fig 8

7B- 5 FRONT AXLE

Removal and refitment

Special Tools:

MF 485 / 1 Pivot Pin Seal Installer

MF 444 Axle pivot pin remover

Removal

1. Place a floor jack under the engine sump and take the weight of the front of the tractor. DO NOT lift the front wheels off the ground.
2. Remove the front weights, if fitted.
3. Remove the front weight frame.
4. Disconnect the steering ram hoses at the cylinder end. Cap the ends of the pipes and hoses to prevent the ingress of dirt.
5. Disconnect the front axle propeller shaft guard.
6. Disconnect the propeller shaft.
7. Remove the Battery tray from the tractor.
8. Remove the axle pivot pin. If difficulty is experienced in removal, use special tool MF 444 to extract the pin from the front support.

WARNING: Prevent the axle from tilting or rotating about the wheels if the axle is wheeled from under the tractor on its wheels. It could cause injury if precautions are not taken.

9. Jack up the front of the tractor so that the axle can be wheeled out from under the tractor.

   or

   Remove the wheels, and with the aid of a crane, sling the axle on ropes and lift out from under the tractor.
10. Recover the two seals and thrust washers located each side of the axle pivot.
11. Place the axle on two axle stands and remove the wheels.

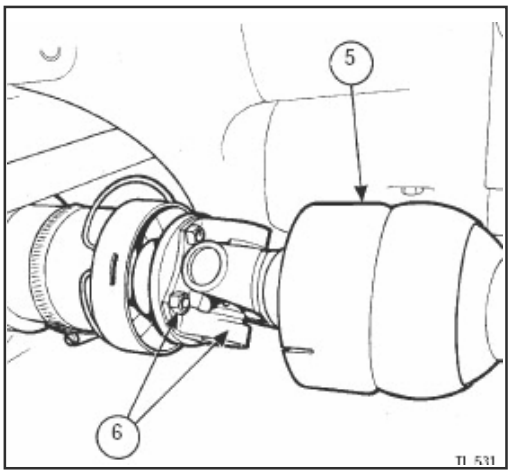


Fig 9

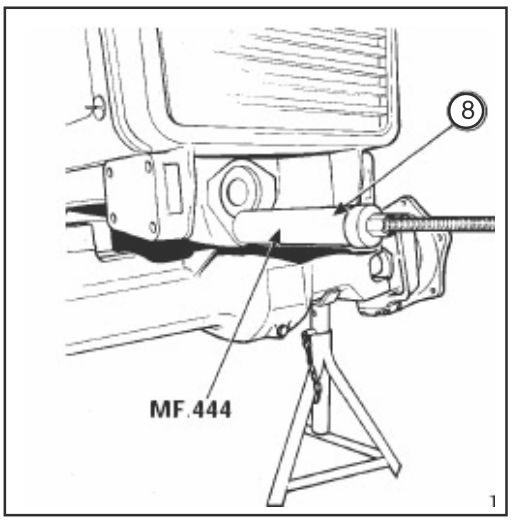


Fig 10

Refitment

12. The axle pivot pin is fitted with two dirt seals at the front and back between the axle and the support casting.
13. With the aid of an overhead crane sling the axle so that it is horizontal in both directions. Place the axle under the front support casting.
14. Carefully lift the front axle up into position under the tractor. DO NOT damage or move the seal assembly fitted to the rear pivot pin hole.
15. Align the pivot pin hole. Part fit the pivot pin as shown in the illustration. DO NOT push the pivot pin right in.

16. Take the second seal and assembly tool MF 485 / 1 Pivot Pin Seal Installer.

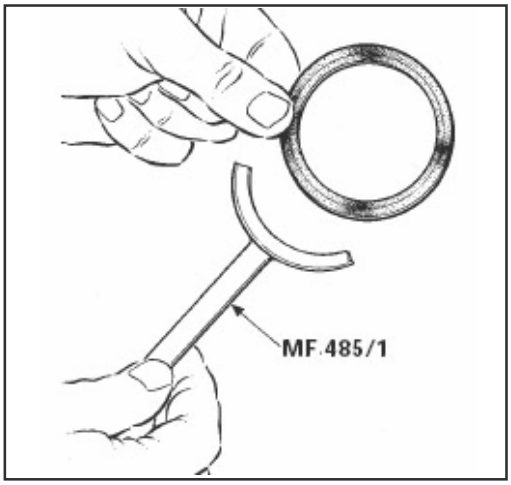


Fig 11

17. Squeeze the lips of the seal together and carefully fit it into the groove in the seal installer.

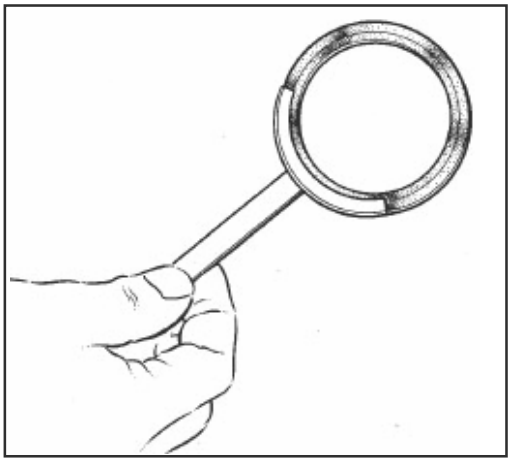


Fig 12

18. Install the steel washer inside the seal holding it in place with a little grease.

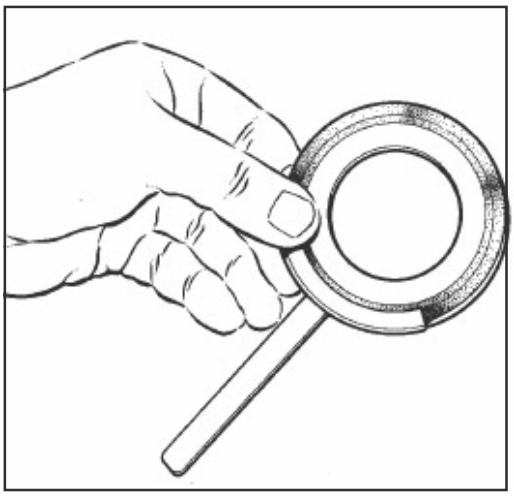


Fig 13

19. Holding the axle in place so that it does not move, remove the pivot pin.
20. Slide the seal, washer and tool assembly into position from right to left leading with the handle as shown in the illustration. DO NOT use the handle to pull it into place.
21. When the hole in the seal and washer assembly, axle and front support casting are in line, replace the pivot pin.
22. Push the pivot pin right in, this will push out the rear plastic plug used to hold the rear seal assembly in place.

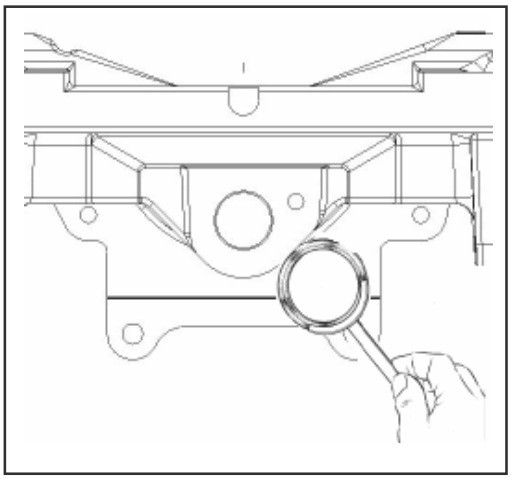


Fig 14

23. When the pivot pin has been installed remove the tool by pulling it away from the seal with the handle.
24. Reverse procedures 1 to 8 except:

    a. Grease the axle pivot pin.

    b.Check steering function to ensure that hydraulic hoses to the steering ram have been correctly connected up.

    c. Check that the steering hoses are correctly routed to prevent chaffing on sharp edges.

    d. Check the power steering pump oil level, if fitted to this tractor, and remove air from the system.

7B - 6 PLANETARY CARRIER

Removal and refitment

Removal

1. Apply the parking brake and secure the rear wheels.
2. Raise the tractor under the side of the axle to be worked on, then support the axle on an axle stand and remove the wheel.
3. On all footstep tractors with four-wheel drive engagement, disconnect the propeller shaft.
4. Rotate the hub until the plug is at the bottom.Remove the wheel and the plug (8 mm hexagon key will be required) and drain the oil from the hub.
5. Mark the position of the planetary carrier in relation to hub to assist alignment during refitment.
6. Remove the 10 cap screws in the planetary carrier.
7. Remove the planetary carrier.

Refitment

8. Reverse procedures 1 to 7 except:

   a. Apply Massey Ferguson Instant Gasket (Loctite 596) to the hub face.

   b. Apply a light coating of loctite 118 to the planetary carrier bolts or cap screws. Tighten the bolts to a torque of 60 - 70 Nm (44 - 51 lbf.ft).

   c. Rotate the wheel so that the plug is horizontal. Fill the hub to this specified level with an approved oil and refit the plug.

   d. Tighten the wheel nuts to a torque of 199 lbf.ft (270 Nm).

   e. Reconnect the propeller shaft.

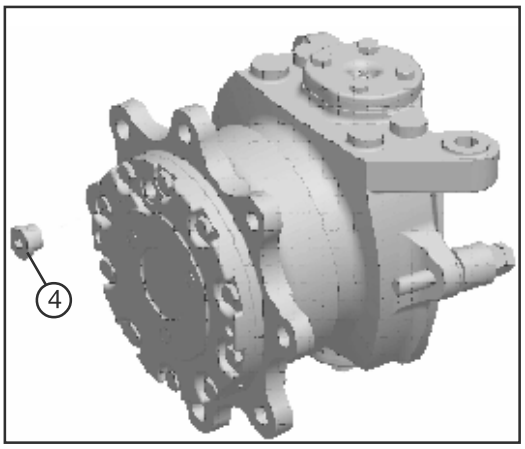


Fig 15

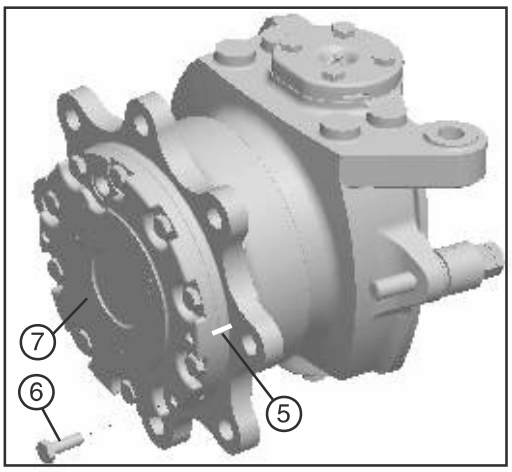


Fig 16

7B - 7 PLANETARY CARRIER

Over hauling

Special Tools :

SER / 316 Pusher to press the pinion planetary

Removal

1. Apply the parking brake and secure the rear wheels.
2. Raise the tractor under the side of the axle to be worked on, then support the axle on an axle stand and remove the wheel.
3. Remove the planetary carrier refer operation 7B - 6
4. Tap the pin planetary (1) with suitable rod.
5. Remove the planetary gear (2) with needle roller (3).
6. Remove the thrust washer (4).
7. Repeat the procedure 4 to 6 for removal of remaining gears.

Refitment

8. Reverse procedures 1 to 7 except:

   a.Press the pin planetary by using SER / 316.

   b.Apply Massey Ferguson Instant Gasket (Loctite 596) to the hub face.

   c.Apply a light coating of loctite 118 to the planetary carrier bolts or cap screws. Tighten the bolts to a torque of 44 - 52 lbf.ft (60 - 70 Nm).

   d.Rotate the wheel so that the plug is horizontal. Fill the hub with specified quantity of oil and refit the plug.

   e.Tighten the wheel nuts to a torque of 199 lbf.ft (270 Nm).

   f. Reconnect the propeller shaft.

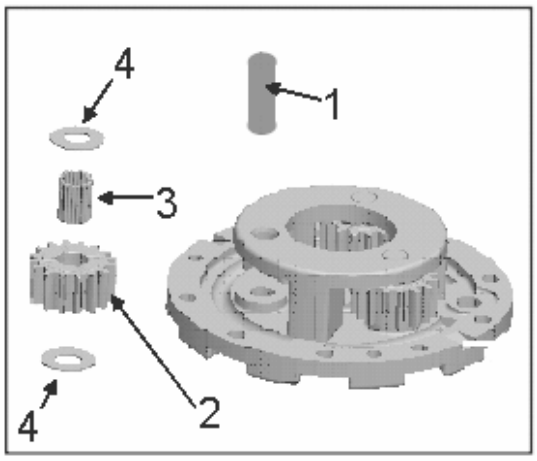


Fig 17

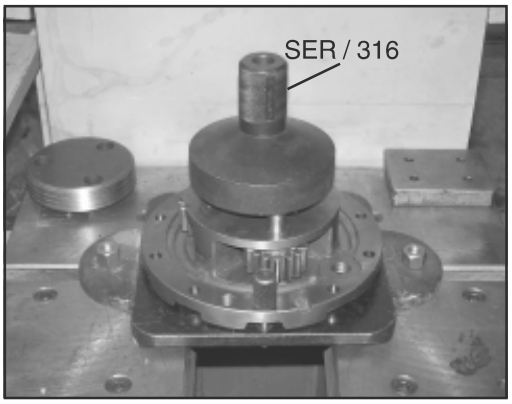


Fig 18

7B- 8 HUB OIL SEAL

Removal and refitment

Special tools:

SER / 315 - Torque wrench socket

SER / 310 - Oil seal presser.

SER / 314 - Press cone bearing in annular gear

SER / 311 - Press to bearing cup in inner wheel hub

1. Remove the planetary carrier, see operation 7B - 6.
2. Remove the circlip (1) and sun gear (2) from the wheel hub.
3. With a narrow cold chisel and mallet carefully unstake the tab washer (3) from lock nut (4).
4. Using special tool SER / 315 remove the lock nut.

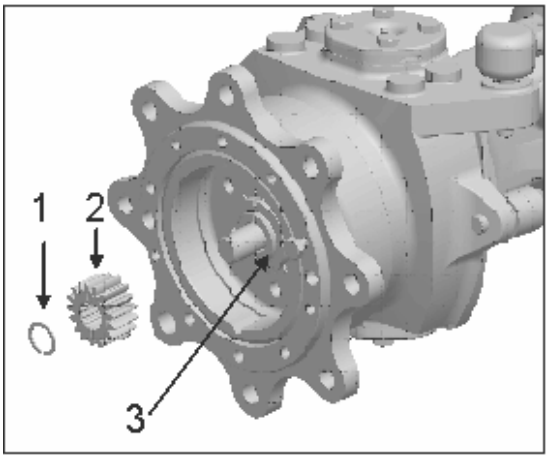


Fig 19

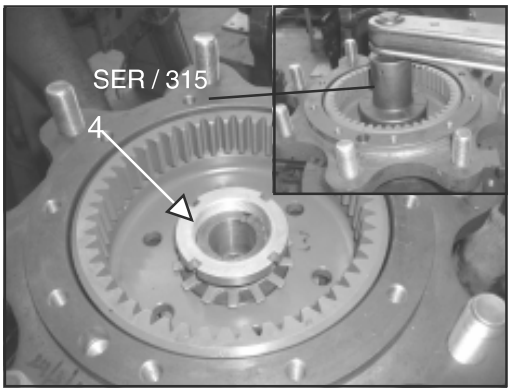


Fig 20

5. Remove the tab washer and spacer.

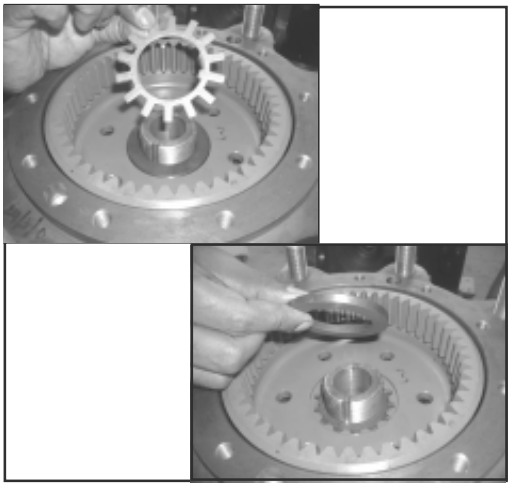


Fig 21

6. Remove the annular ring gear, hub spacer and wheel hub from the swivel housing. If necessary remove the two bearing cups and cone using puller.

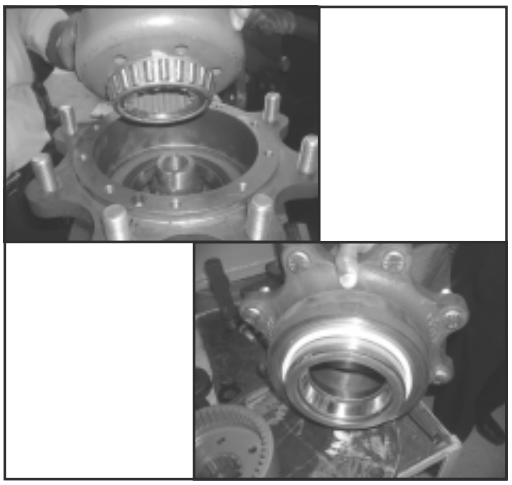


Fig 22

7. Remove the dirt seal from the back of the hub.
8. With a screw driver , remove the large seal and remove from the housing.
9. Check for any visual damages , if any before assembly.

   IMPORTANT: *Apply loctite 118 in all the threads of the forcing screw .*

10. Clean all components for reassembly.

Refitment

11. Fit a bearing cone into the swivel housing and fit a cup into the wheel hub using SER / 311 and ensure zero gap.
12. Using special tool SER / 310 Hub Seal Installer fit a new oil seal. Place the seal on the tool with the lip facing outwards.
13. Offer the seal and tool assembly up to the swivel housing, with a hammer, gently drive the seal into the housing.
14. Fit the a new oil seal wear ring using a mallet. Drive the wear ring down onto the hub using the same method when fitting the oil seal.

    NOTE: *The radius edge of the wear ring must face outwards.*

16. Renew the dirt lip seal on the back of the hub.
17. Fill the space between the dirt seal and the lip seal with general purpose grease. It must be 30 to 50% full. Also apply generous application grease to the lips of the seal.
18. Replace the hub.

Fig 23

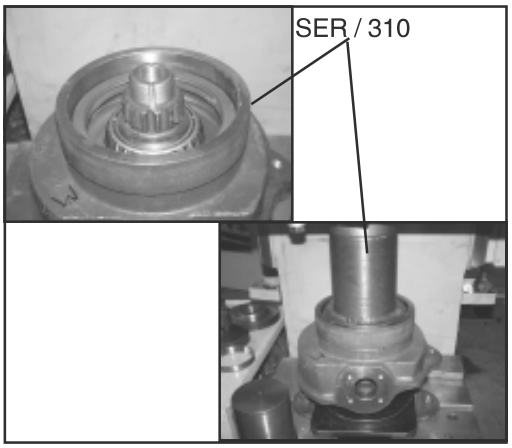


Fig 24

19. Replace the annular ring gear bearing cone by using SER / 314.
20. Slide the wheel hub assembly into position.
21. Push the wheel hub into the oil seal.
22. Replace the hub spacer.
23. Replace the annular ring gear.
24. Replace the spacer.
25. Replace the tab washer.

    IMPORTANT: *Aplly loctite 118 in all the threads of the forcing screw.*

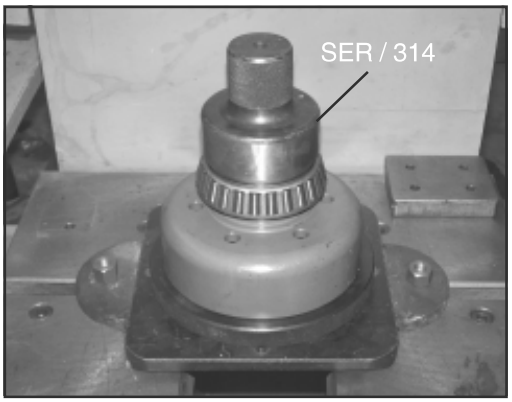


Fig 25

26. Replace the lock nut and tighten dry to a torque of 250 - 258 lbf.ft. (340 - 350 Nm) using SER / 315
27. Check the end float of wheel hub with respect to swivel housing . The recommended end float is 0.039 - 0.0118 inch (0.1 to 0.3 mm) . If the end float exceeds recommended specification loosen the retaining nut and select the suitable hub spacer and ensure the end float is 0.039 - 0.0118 inch (0.1 to 0.3 mm) .

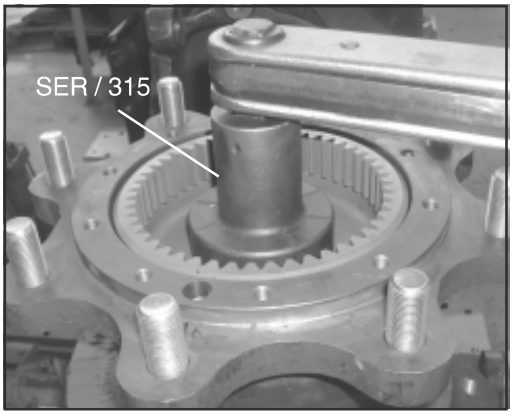


Fig 26

SL.NO	Part Number	"X"+/- 0.002inch (0.05 mm) Thickness	
		mm	Inch
1	2214C01801	5.90	0.2323
2	2214C01901	6.00	0.2362
3	2214C02001	6.10	0.2402
4	2214C02801	6.20	0.2441
5	2214C02901	6.30	0.2480
6	2214C03001	6.40	0.2520
7	2214C03101	6.50	0.2559
8	2214C03201	6.60	0.2598
9	2214C03301	6.70	0.2638

28. Fold two tabs of tab washer into slot lock nut.
29. Replace the sun gear and circlip.
30. Replace the planetary carrier.

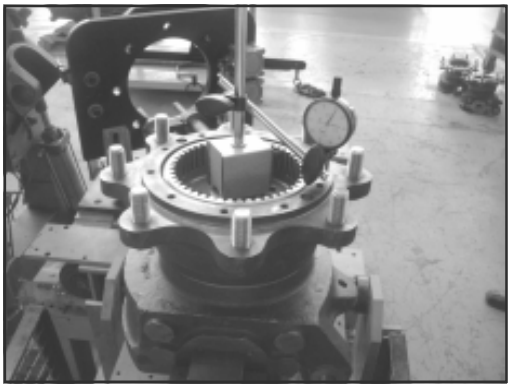


Fig 27

7B - 9 SWIVEL HOUSING AND PINS

Removal and refitment

Special Tools:

SER / 309	Bearing Puller - Main Tool.
SER / 308	Press needle roller bearing into the swivel housing
SER / 319	Pusher to press cup bearing in king pin bores.
SER / 320	Pusher to press oil seal in king pin bores

Removal

1. Remove the steering ball joint nut.
2. Release the steering ball joint from the swivel housing.
3. Remove the planetary carrier refer operation 7B- 6.
4. Remove the Wheel hub refer operation 7B - 8.
5. Remove the four bolts from the king pin from top and bottom.
6. Using screw driver pull the king pin until it comes out from axle.
7. Remove the king pins from the swivel housing.
8. Remove the king pin shims.
9. Remove the swivel assembly from the axle.
10. Remove the oil seal from the swivel housing.
11. Remove the circlip.
12. Remove the needle roller bearing
13. Remove the oil seal in the axle housing.If necessary remove the bearing cup in axle housing.

IMPORTANT: *Lubricate all the threads of the forcing screw.*

Examination

Thoroughly clean and inspect all components and renew any that are worn or damaged. Renew all seals.

Refitment

14. Renew the seals on the axle housing using SER / 320 and swivel housing and refit the bearing cone by using SER/ 309.Install the needle roller bearing into the swivel housing using SER / 308.
15. Fit the bearing cones to the king pins and cups in axle housing bores using SER / 319. DO NOT grease the bearings at this stage.

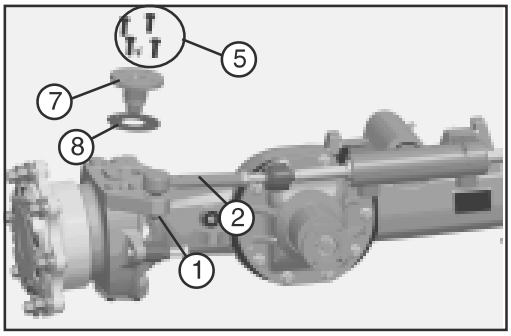


Fig 28

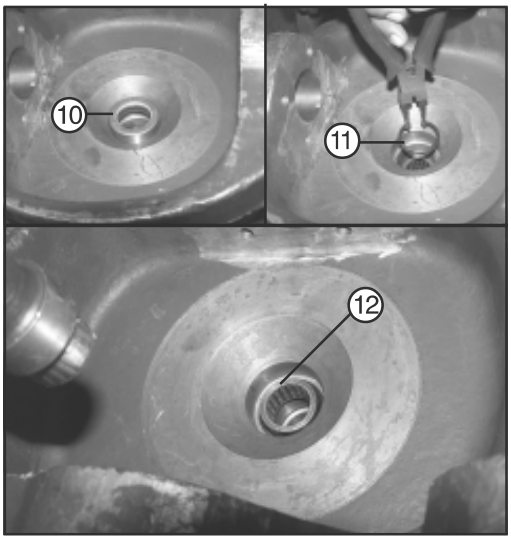


Fig 29

Fig 30

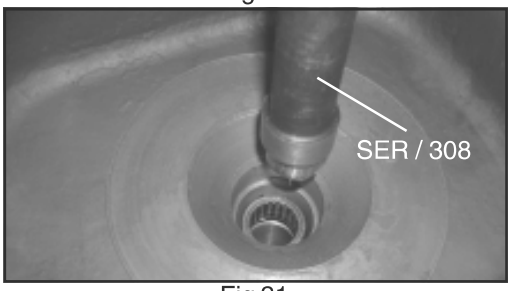


Fig 31

16. Coat the king pins and holes with a light application of grease.
17. Hold the swivel housing in position and partly fit the upper king pin to locate the assembly.
18. Refit the lower king pin, bearing cup, and bolts. NO shims are fitted to the lower king pin and also insert the dummy king pin on top and lightly tapping it by using mallet.
19. Tighten all the four bolts evenly and in sequence to pull the lower king pin into the housing. Tighten the four bolts to a torque of 44 - 51 lbf.ft (60 - 70 Nm).
20. Hand tight the top side two bolts with spanner.
21. Ensure that both king pins are fully seated onto the axle casing.
22. Check the gap between swivel housing and king pin by using feeler gauge.
23. Select shims such that the gap is 0.0059 inch (0.15 mm) maximum.
24. Remove the dummy king pin and bearing cone. Fill the bearing with grease, fit the correct number of shims, replace the king pin.
25. Apply loctite 118 to the threads of the bolts and tighten to a torque of 44 - 51 lbf.ft (60 - 70 Nm).
26. Remove the lower king pin and cone and fill the bearing with grease. Tighten the bolts as described in procedure 19.
28. Grease both bearings with a grease gun to ensure that they are full.
29. Apply loctite 118 to the thread and tighten the ball joint nut to a torque of 114 - 125 lbf.ft (155 - 170 Nm).

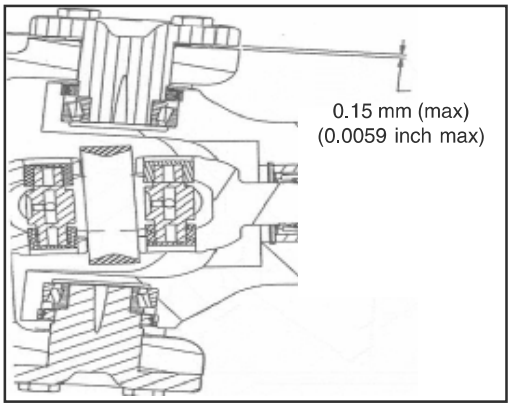


Fig 32

SL.NO	Part Number	Thickness "X"	
		mm	inch
1	4256224M1	0.13 +/- 0.02	0.0051 +/- 0.0008
2	4256225M1	0.25 +/- 0.03	0.0098 +/- 0.0012
3	4256226M1	0.50 +/- 0.03	0.0197 +/- 0.0012

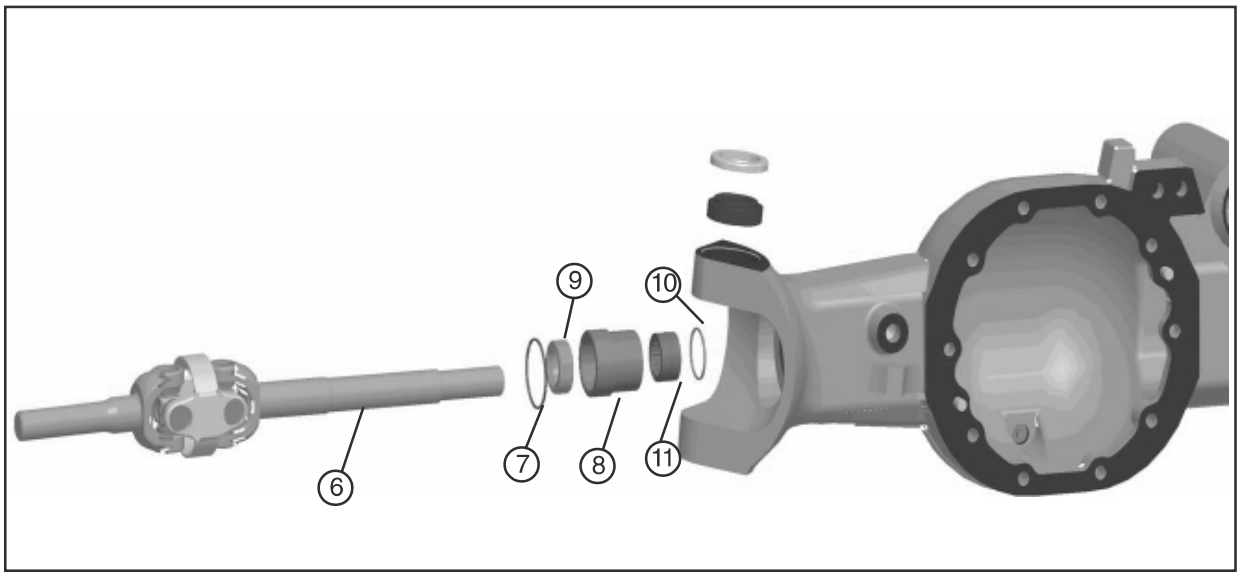


Fig 33

7B - 10 DRIVE SHAFT AND OIL SEALS

Removal and refitment

Special tools :

SER / 317	Press needle roller bearing into the sleeve assembly.
SER / 318	Press oil seal into the sleeve assembly.
SER / 360	Drive shaft end float checking tool

Removal

1. Drain oil from the axle housing.
2. Remove the planetary carrier, see operation 7B - 6.
3. Remove the circlip and sun gear.
4. Remove the wheel hub see operation 7B - 8.
5. Remove the swivel housing, see operation 7B - 9.
6. Remove the drive shaft from axle casing.
7. Remove the circlip by using suitable circlip plier.
8. Remove the sleeve assembly by using suitable extractor
9. Lever the seal out of the sleeve assembly.
10. Remove the internal circlip.
11. Remove the needle roller bearing.

Examination

Carefully inspect the universal joints in the drive shaft, if there is any sign of wear renew the joints or fit new shafts. Inspect the condition of the drive

sleeve, renew if necessary.

Refitment

12. To install needle roller bearing using SER / 317,circlip and oil seals into the sleeve assembly using SER / 318 . It will be necessary to make

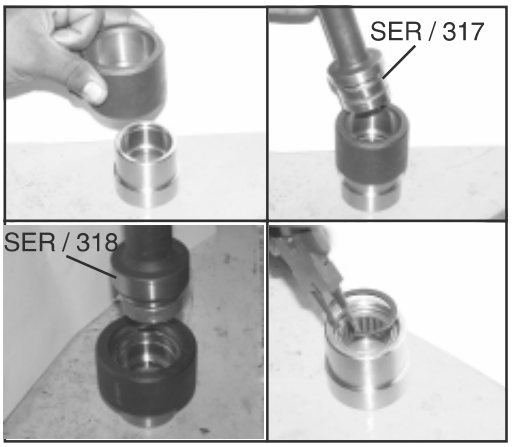


Fig 34

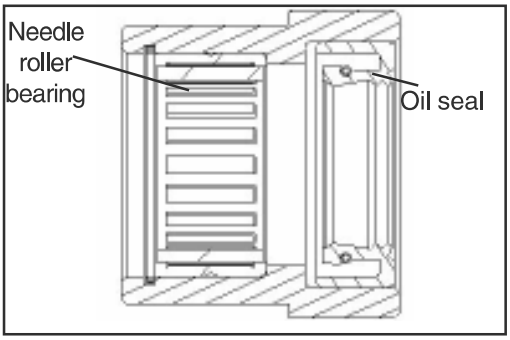


Fig 35

two service tools. This will ensure that the components are correctly fitted.

13. Place the sleeve assembly and drive it into the housing and secure with circlip.
14. Drive the sleeve assembly into the axle housing

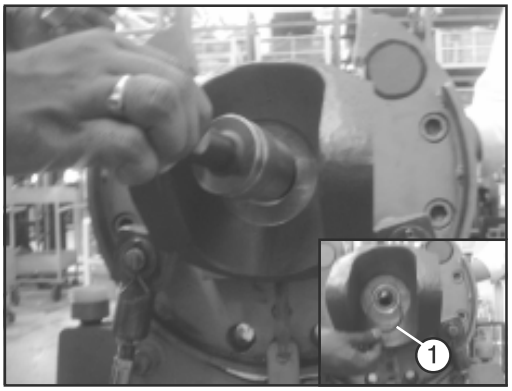


Fig 36

and secure with circlip (1).

15. Fill the seal cavity with a multi purpose grease.
16. Refit the drive shaft into the axle housing taking care not to damage the oil seal when locating the splines.
17. Refit the swivel housing, wheel hub and planetary.

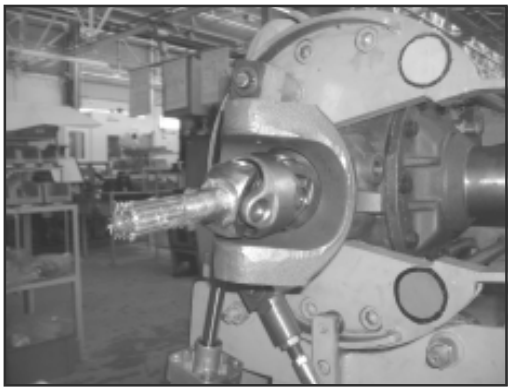


Fig 37

18. Pick the SER 360 drive shaft end float checking tool and fit into the wheel hub and measure gap using feeler gauge.
19. According to the clearance between shaft end and tool. Select the steel washer thickness at higher side refer below table (i.e Drive shaft end float should be 0.011 inch (0.3 mm) max).

SL.NO	Part Number	Thickness "X"	
		mm (+/- 0.05)	inch (+/- 0.0019)
1	2212C01701	2.4	0.0944
2	2212C00601	2.6	0.1023
3	2212C01801	2.8	0.1102
4	2212C01901	3.0	0.1181
5	2212C02001	3.2	0.1259
6	2212C02101	3.4	0.1338

20. Apply grease over the steel washer and place the same inside the planetary carrier.
21. Refit the planetary carrier.
22. Refill the both axle and planetary carrier to the specified level with an approved level of oil.

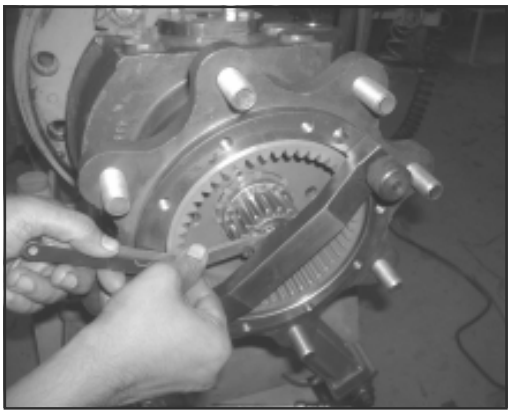


Fig 37 A

7B - 11 DRIVE SHAFT

Overhaul

Dis-assembly

1. Remove the drive shaft, see operation 7B - 10.
2. Hold the inner section of the drive shaft in a soft faced vice.
3. Remove the four circlips from each end of the universal joint.
4. Using a hammer, drive the central yoke downwards until the bearing sleeve protrudes.
5. Clamp the bearing sleeve in a vice and tap the central yoke from the bearing.
6. Remove the opposing bearing sleeve in the same way and remove the outer section of the shaft.
7. Turn the shaft assembly through 90° then repeat procedures 4 to 6 to free the other universal joint from the shaft.
8. Grip the outer section of the drive shaft in a vice and repeat procedures 2 to 7.

Examination

Pay particular attention to the axle shaft splines. Inspect all components and renew any which show signs of wear or damage. Always renew the universal joint as an assembly including the joint, bearings, caps, circlips and seals.

Reassembly

9. Ensure that the needle rollers are held in place. Apply grease in the bearing sleeve.
10. Position the cross within the yoke and move it sideways as far as possible to provide a guide for the needle rollers in the bearing sleeve when being refitted.
11. Slide the bearing sleeve onto the cross and drive the bearing into the yoke deep enough to permit the insertion of the circlip.
12. Assemble the remaining sleeves and universal joint in a similar method.
13. Refit the drive shaft to the axle.

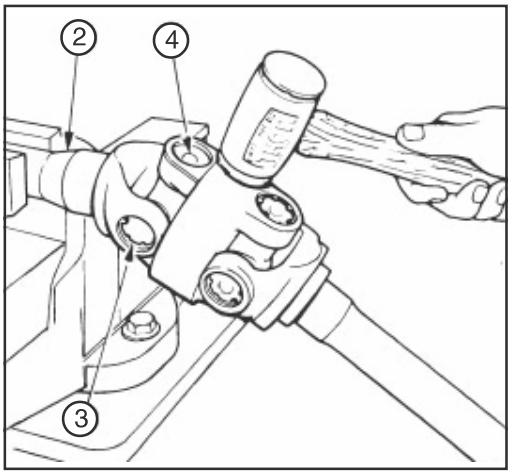


Fig 38

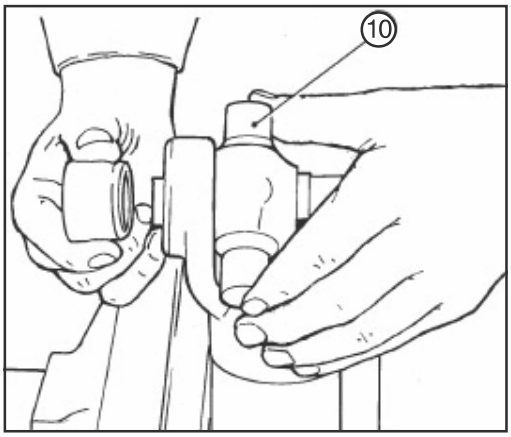


Fig 38

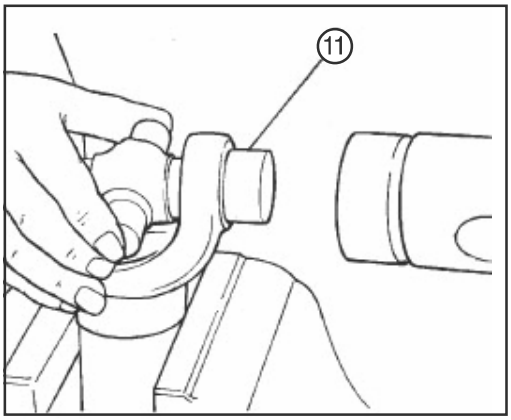


Fig 39

7B - 12 DIFFERENTIAL CARRIER ASSEMBLY

Removal and refitment

Removal

1. Secure the tractor by applying the parking brake.
2. Jack up the front of the tractor and support under the engine.
3. Slide back the propeller shaft guard and disconnect the propeller shaft.
4. Remove the axle from the tractor, see operation 7B - 5.
5. Remove both front wheels.
6. Drain the oil from the axle housing.
7. Remove both swivel housings, see operation 7B - 9 .It is not necessary to dismantle the planetary hubs.
8. Remove the steering ram, see operation 7B - 16.
9. Remove the ten bolts holding the differential carrier to the axle casing.

WARNING: Take care when removing the differential carrier assembly, it is uncomfortable and heavy to handle.

10. The differential is located by dowels in the axle casing. Carefully pry it away from the axle housing supporting the weight at all times.

Refitment

11. Reverse procedures 1 to 10 except:

    a. Apply Massey Ferguson Instant Gasket (Loctite 596) to the joint face of the differential case.

    b. Apply loctite 118 to the differential carrier bolts and tighten them to a torque of 95 - 103 lbf.ft (130 - 140 Nm)

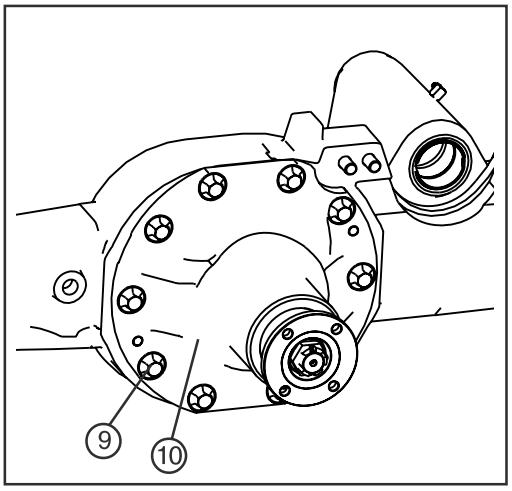


Fig 40

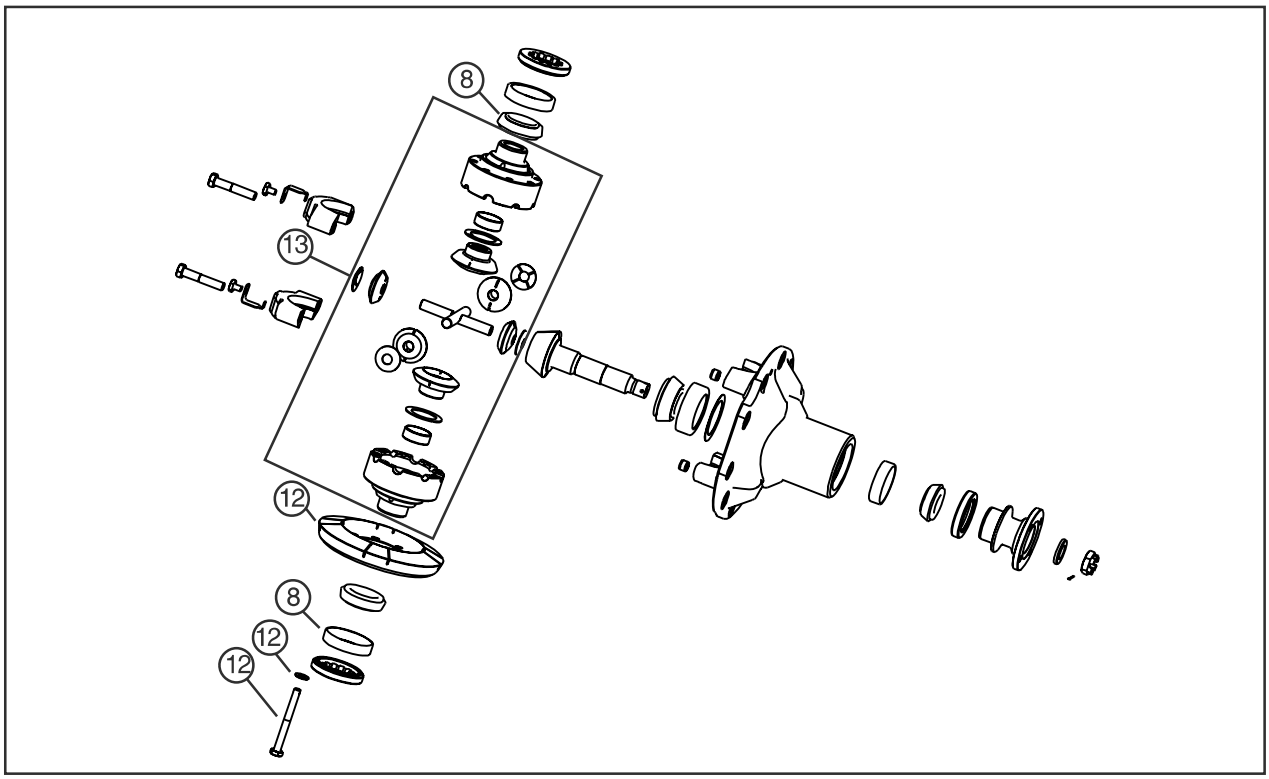


Fig 41

7B - 13 DIFFERENTIAL ASSEMBLY

Overhaul

Special tools :

SER / 300	Press bush in differential case.
SER / 302	Press cone in differential case.
SER / 303	Press crown wheel into the differential case left - hand.

Disassembly

1. Remove the differential assembly, see operation 7B - 12.
2. Hold the differential assembly in the jaws of a vice.
3. Mark the end caps and casting to aid reassembly.
4. Remove the securing bolts.
5. Remove the lock plate.
6. Unscrew the bearing adjustment ring nut.
7. Remove the cap bolts.
8. Remove the bearing caps.
9. Lift the differential assembly out of the differential carrier.
10. Remove the bearing cups.
11. Mark the two halves of the differential case and the crownwheel to aid re-assembly.

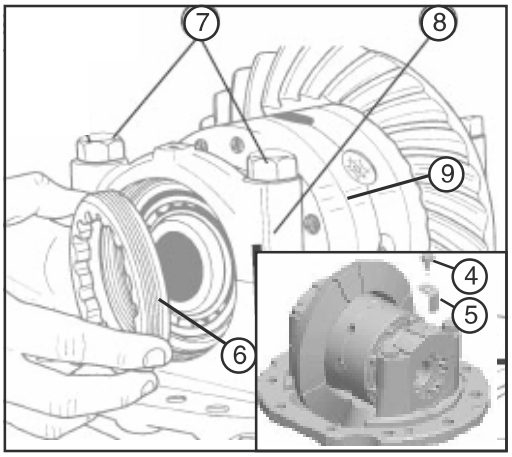


Fig 42

12. Place the crownwheel and differential unit in the vice and remove the wire and 8 bolts and washers.
13. Split the differential case and remove the differential gears, cross pins, thrust washers and crown wheel. Remove the bearing cups and cones.

Examination

14. Thoroughly clean and inspect all components. Any parts showing signs of wear or damage must be renewed.

Re-assembly

15. Refit or renew the taper roller bearing cones using SER / 302 if they have been removed.

16. Press the differential bush using SER / 300 and refit the differential gears, cross shaft and thrust washers into the case .

17. Align the previously made marks on the case and press the crownwheel using SER / 303 if the original wheel is being reused. Refit the 8 bolts and washers, apply stud lock (Loctite 118) to the threads and tighten to a torque of 59 - 66 lbf.ft (80 to 90 Nm).Secure the bolts with lock wire.

18. Install the differential case assembly in to the differential carrier.

19. Align the previous made marks on the differential carrier to bearing caps and tap the bearing caps.Ensure the dowel rings are properly seated.

20. Tighten the bearing caps (Hand tighten only).

21. Install the ring nuts on both sides.

22. Turn the left-hand ring nut (Crown wheel side) until the crown wheel contacts the pinion (ZERO Backlash) and then back off by two slots approximately. Ensure ring nuts slots aligns with lock washer mounting hole(Bearing pre load 0.002 to 0.004 inch or 0.05 to 0.1 mm).

23. To preload the differential bearings, fix the dial gauge on the differential carrier face and put the dial gauge stem on the bearing cap of the left-hand side, then screw the ring nut in right-hand side till 0.05 mm (0.002 inch) deflection then if needed further screw up to 0.05 mm (0.002 inch) deflection to align the ring nut slot with lock washer.

24. Measure backlash at three places 120° apart. Make sure it is within specification 0.006 to 0.010 inch (0.15 - 0.25 mm).

25. If you have backlash more than the specification , the crown wheel needs to move closer to the pinion. Loosen the right-hand ring nut (Away from crown wheel) and tight same amount in left hand side ring nut.

26. If you have backlash less than the specification , the crown wheel needs to move away from the pinion. Loosen the left-hand ring nut (near to crown wheel) and tight same amount in right hand side ring nut.

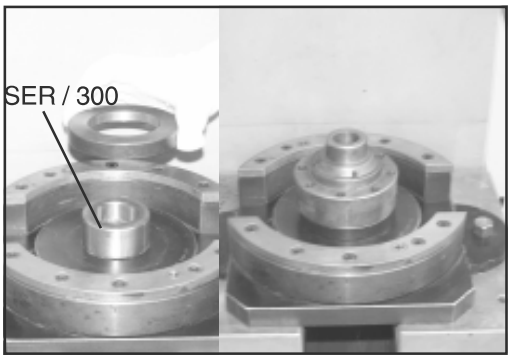


Fig 43

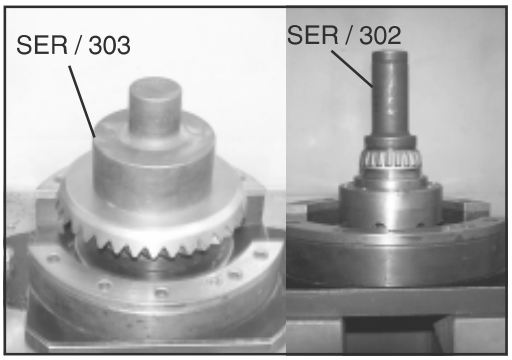


Fig 44

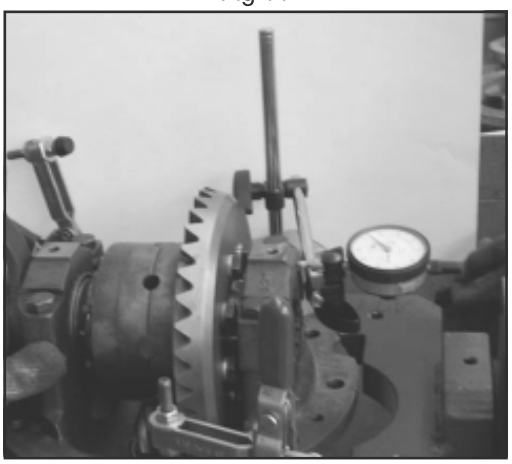


Fig 45

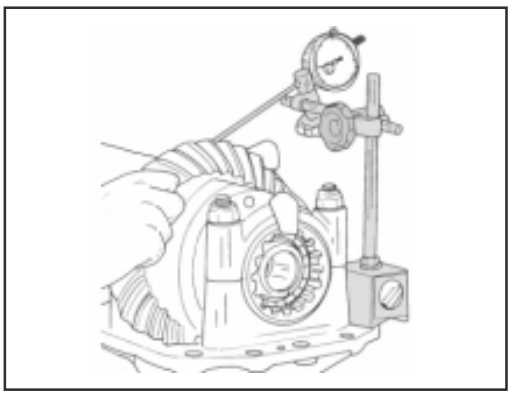


Fig 46

Measuring of crown wheel runout:

27. Measure crown wheel total outer diameter runout (Indicator reading should not exceeds 0.006 inch or 0.15 mm). If runout exceeds more than the specification reject the crown wheel pair and use new pair.

Measuring of crown wheel face runout:

28. Measure crown wheel total face runout (Indicator reading should not exceeds 0.006 inch or 0.15 mm) If exceeds more than the specification disassemble the differential case sub assembly and look for any issues. After reassemble if any problem persists, reject the crown wheel pinion and use new pair.

Contact pattern

29. To check the contact pattern of the bevel gear , paint four tooth of crown wheel in two place at 180° apart.
30. Rotate the pinion with tool both in clockwise and anti clock wise direction.
31. Take the contact pattern by transparent tape from two places 180° apart (Convex side).
32. Paste all pattern in crown wheel pinion assembly record sheet.
33. If contact pattern is like in the illustration 1 , then accept the assembly, other wise adjust as follows.
34. If the pattern is to close to the edge of the tooth toe as in illustration 2, move the crown wheel away from the pinion to increase backlash.

    Loosen the left-hand side ring nut by 1/2 or 1 slot (As required).

    Tighten the right-hand side ring nut by same amount so that differential bearing preload is maintained.

    Recheck the backlash and ensure it is with in specification.
35. If the pattern is concenterated at the heel as in illustration 3, move the crown wheel towards the pinion to decrease backlash.

    Loosen the right-hand side ring nut by 1/2 or 1 slot (As required).

    Tighten the left-hand side ring nut by same amount so that differential bearing preload is maintained.

    Recheck the backlash and ensure it is with in specification.

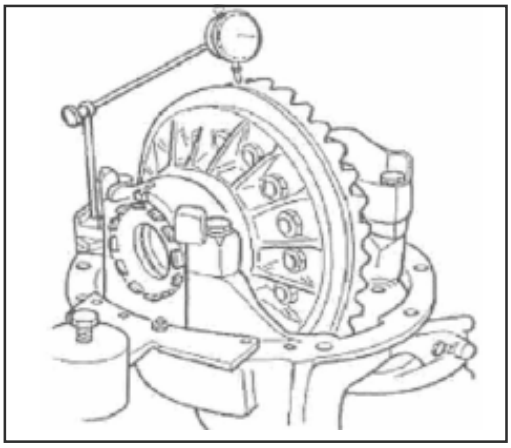


Fig 47

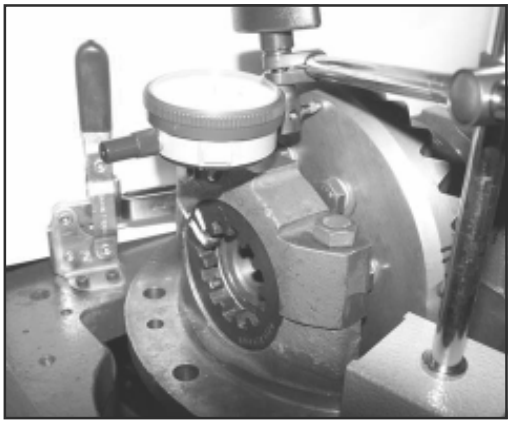


Fig 48

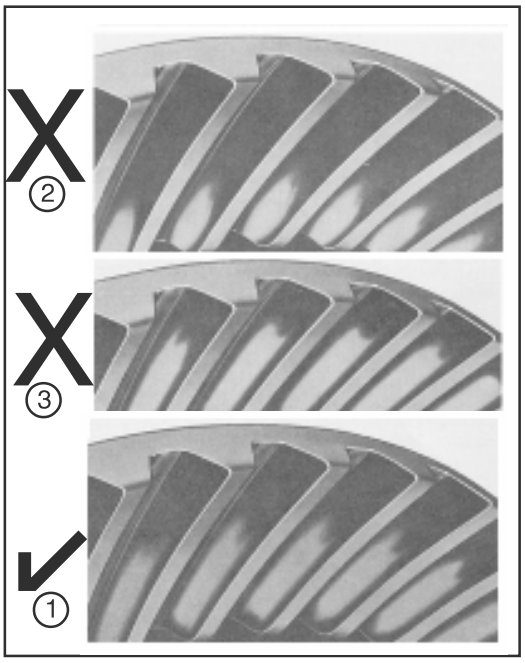


Fig 49

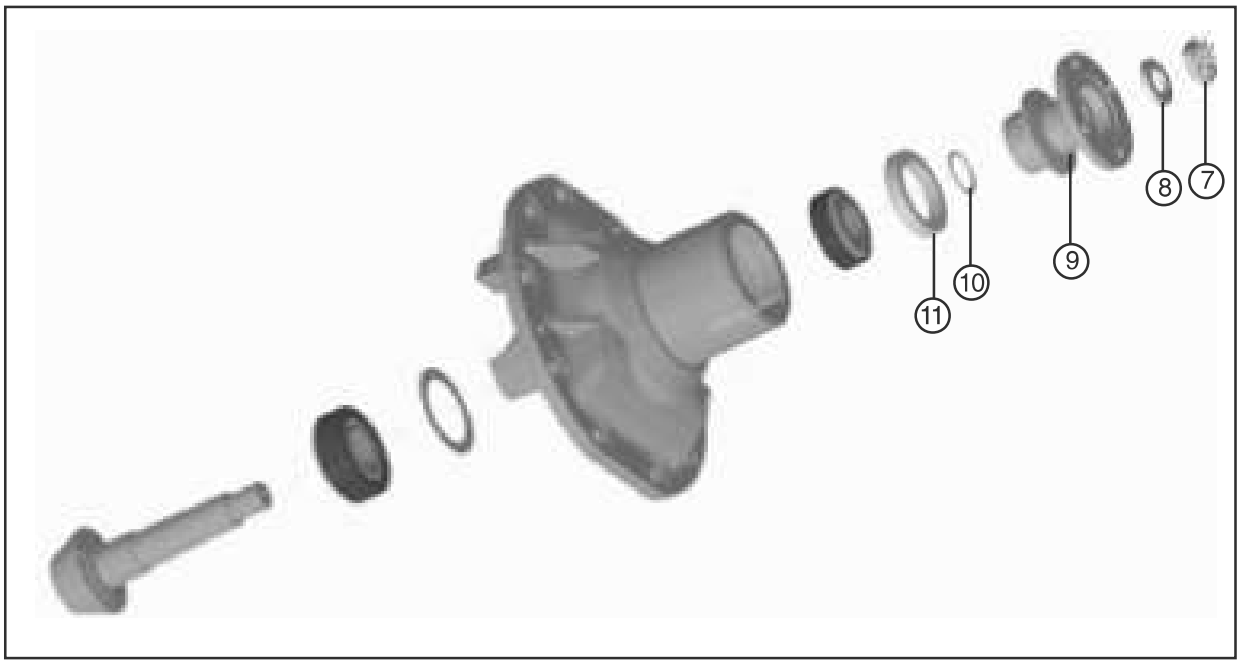


Fig 50

7B - 14 PINION OIL SEAL

Removal and refitment

Special Tools:

SER / 307 Pusher to press oil seal into the differential carrier.

Removal

1. Apply the tractor parking brake.
2. Place a container under the axle housing and drain oil from the axle housing.
3. Slacken the two hose clips and slide back the propeller shaft guard.
4. Slacken the front guard hose clip and slide the guard forward.
5. Remove the four bolts and disconnect the propeller shaft.
6. Unstake the split pin from the castle nut.
7. Using pinion Nut Wrench,remove the pinion castle nut.
8. Remove the washer.
9. Remove the end flange.
10. Remove the 'O' ring and discard.

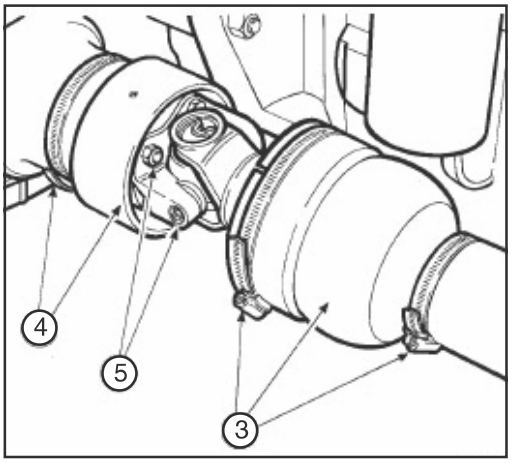


Fig 51

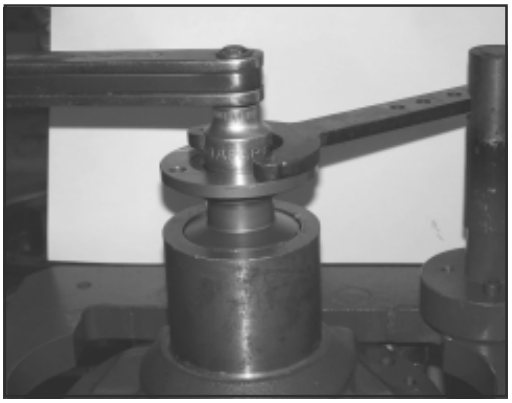


Fig 52

11. Lever the oil seal out of the casing.

Refitment

12. Make the special seal tool as shown in the illustration.
13. Renew the oil seal using SER / 307.
14. Renew the shaft 'O' ring.
15. Apply general purpose grease to the cavity of the oil seal.
16. Replace the end flange.
17. Renew the pinion nut and tighten dry to a torque of 66 - 73 lbf.ft (90 - 100 Nm).
18. Align the castle nut slot with hole in the pinion and secure with split pin.
19. Reconnect the Propeller shaft and guard.
20. Refill the axle housing with an approved oil to the specified quantity.

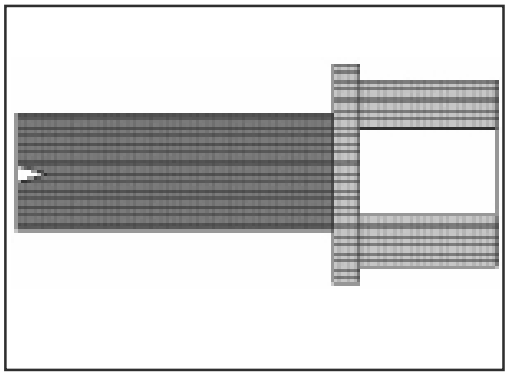


Fig 53

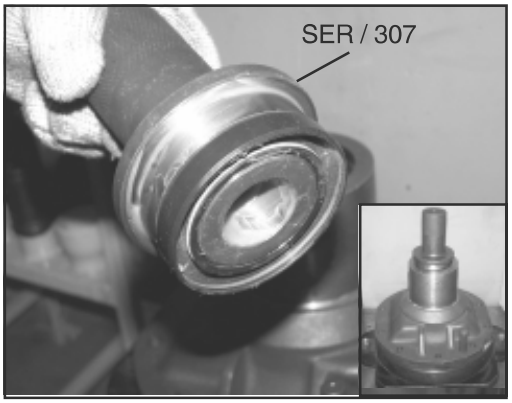


Fig 54

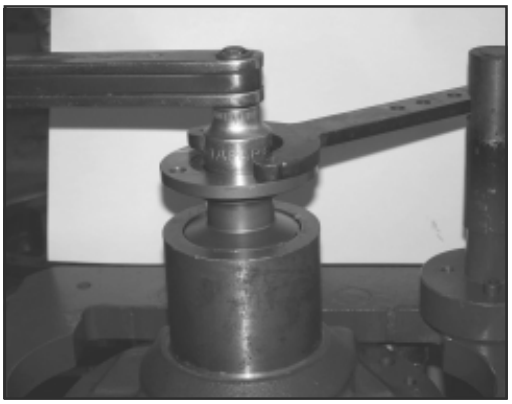


Fig 55

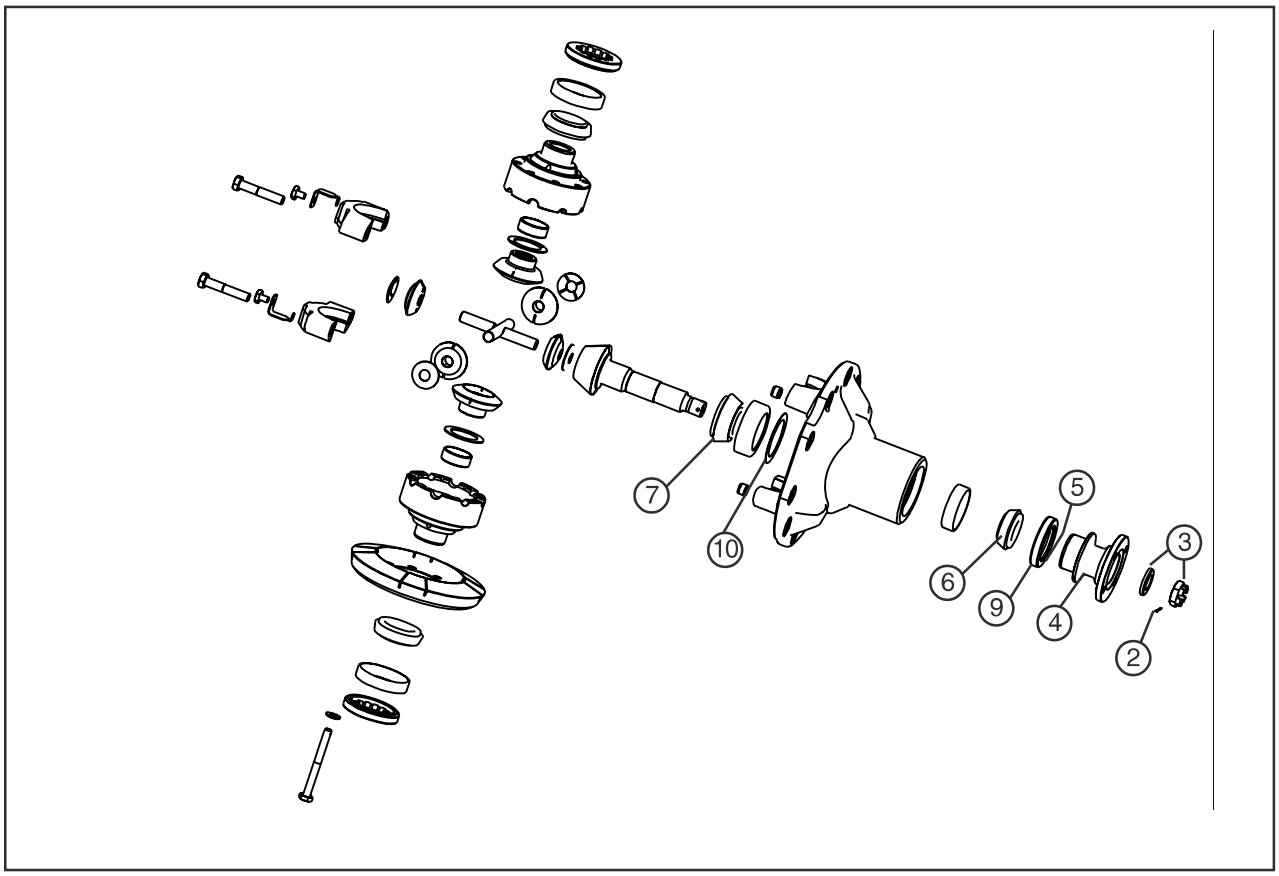


Fig 56

7B - 15 CROWNWHEEL AND PINION

Overhaul

Special Tools:

SER / 304	Press cone into pinion.
SER / 305	Pusher to press bearing cup into inner differential carrier
SER / 306	Pusher to press bearing cup into outer differential carrier.
SER / 307	Pusher to press oil seal into the differential carrier.

Dis-assembly

1. Remove and dismantle the crownwheel and differential assembly, see operation 7B - 12.
2. With a narrow cold chisel and hammer carefully unstake the spilt pin securing it to the castle nut.
3. Using castle Nut Wrench, remove the castle nut and washer .
4. Remove the end flange.
5. Remove the 'O' ring and discard.
6. With the aid of a soft faced hammer or press remove the pinion with bearings from the differential carrier.
7. Remove the outer bearing cone.
8. Remove the inner and outer bearing cups.
9. Remove the oil seal.
10. Remove the bearing pre-load shims and retain for re-assembly.

Examination

Thoroughly clean and inspect all components. Any parts showing signs of wear or damage must be renewed. Renew all 'O' rings, seals and circlips. Ensure that all parts are free from dents or damage.

Re-assembly

The crownwheel and pinion are only available as a matched set. If the crownwheel and pinion are not to be replaced the following instructions on setting the pinion may be disregarded. The two sets of shims must be retained for re-assembly.

It is necessary to carry out a series of measurements and calculations and procedures to establish the exact position of the pinion in relation to the crownwheel and the pinion bearing pre-load. It is recommended that you work in the metric system for ease of calculation.

Pinion settings

12. The height of the pinion is adjusted by shims under the taper roller bearing to obtain dimension. The shims required are calculated in accordance with the following formula:

    Required shim size : A - (B+C)

    A - To be taken from differential carrier stamp.

    B - To be taken from pinion stamp.

    C - Measure the height of taper roller bearing.

S.no	Part number	Shim thickness	
		mm	inch
1	4256108M1	0.08 (+/- 0.01)	0.0031 (+/- 0.0004)
2	4256112M1	0.13 (+/- 0.02)	0.0051 (+/- 0.0008)
3	4256113M1	0.18 (+/- 0.02)	0.0070 (+/- 0.0008)
4	4256114M1	0.25 (+/- 0.02)	0.0098 (+/- 0.0008)
5	4253932M1	0.38 (+/- 0.03)	0.0149 (+/- 0.0012)
6	4253933M1	0.50 (+/- 0.03)	0.0196 (+/- 0.0012)
7	4253934M1	0.80 (+/- 0.05)	0.0314 (+/- 0.0019)

Select the shim nearer to calculated value from above table. More than one shim can be used as per the requirement.

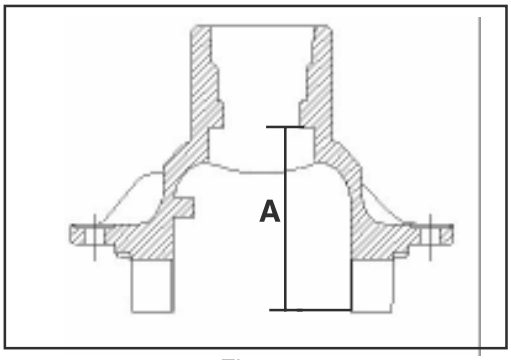


Fig 57

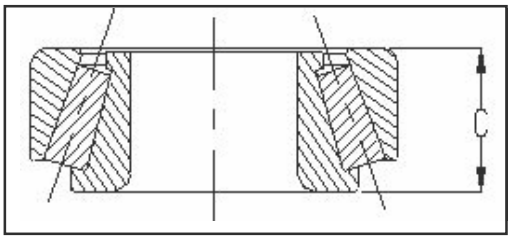


Fig 58

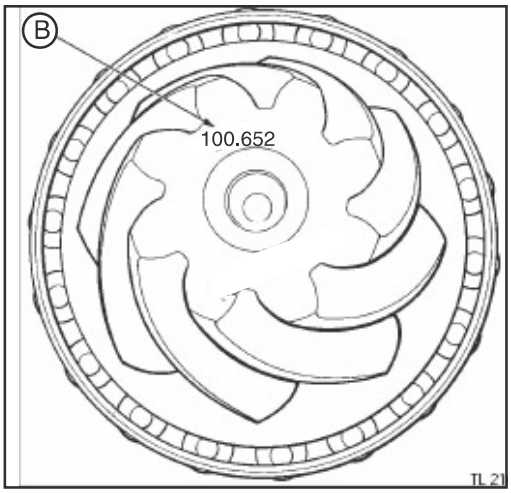


Fig 59

13. Place the suitable shim into the housing and replace the inner bearing cup by using SER / 305 Install another bearing into the differential carrier using SER / 306.

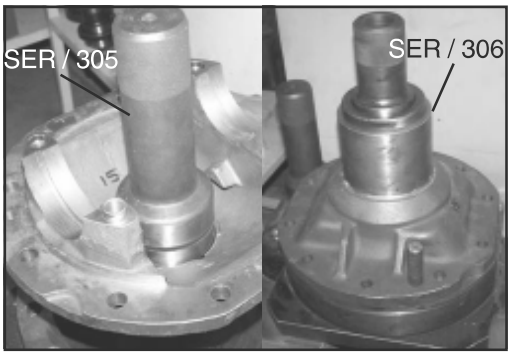


Fig 60

14. Replace the bearing cone into the pinion assembly by using SER / 304.
15. Check the zero gap between pinion face and bearing face by using feeler gauge.

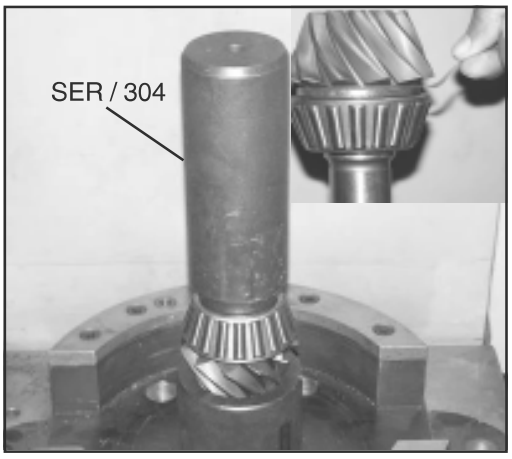


Fig 61

16. Place the pinion assembly into the differential carrier and install the another bearing and press by using SER / 304.
17. Insert the oil seal into the assembly by using SER / 307.
18. Insert the 'O' ring into the pinion assembly.
19. Insert the end flange into the pinion assembly.

Fig 62

20. Install the washer and castle nut and tighten to a torque of 66 lbf.ft. (90 Nm).
21. Ensure the castle nut slot matches with the hole in the pinion shaft. If needed tighten the castle nut up to 73 lbf.ft (100 Nm). Secure the nut with spilt pin.

Fig 63

7B- 16 STEERING RAM

Removal and refitment

Removal

1. Remove the front axle assembly, see operation 7B - 5.
2. Remove the nyloc nut and discard, disconnect both steering ball joints.
3. Holding the ends of the steering ram piston rod with a spanner unscrew both track rods.
4. Remove the four hexagon cap screws (8 mm hexagon wrench will be required) and the steering ram.

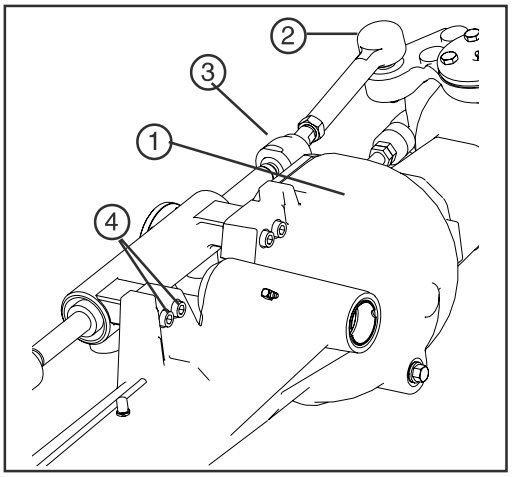


Fig 64

Refitment

5. Reverse procedure except:

   a. Apply Massey Ferguson stud lock (Loctite 118) to the threads and tighten the four cap screws to a torque of 81 - 88 lbf.ft (110 - 120 Nm).

   b. Tighten the steering rod ball joints to a torque of 169 - 184 lbf.ft (230 - 250 Nm).

   c. Apply loctite 118 to the thread and tighten the ball joint nut to a torque of 114 - 125 lbf.ft (155 - 170 Nm).

   d. Check the wheel alignment, see operation 7B - 3.

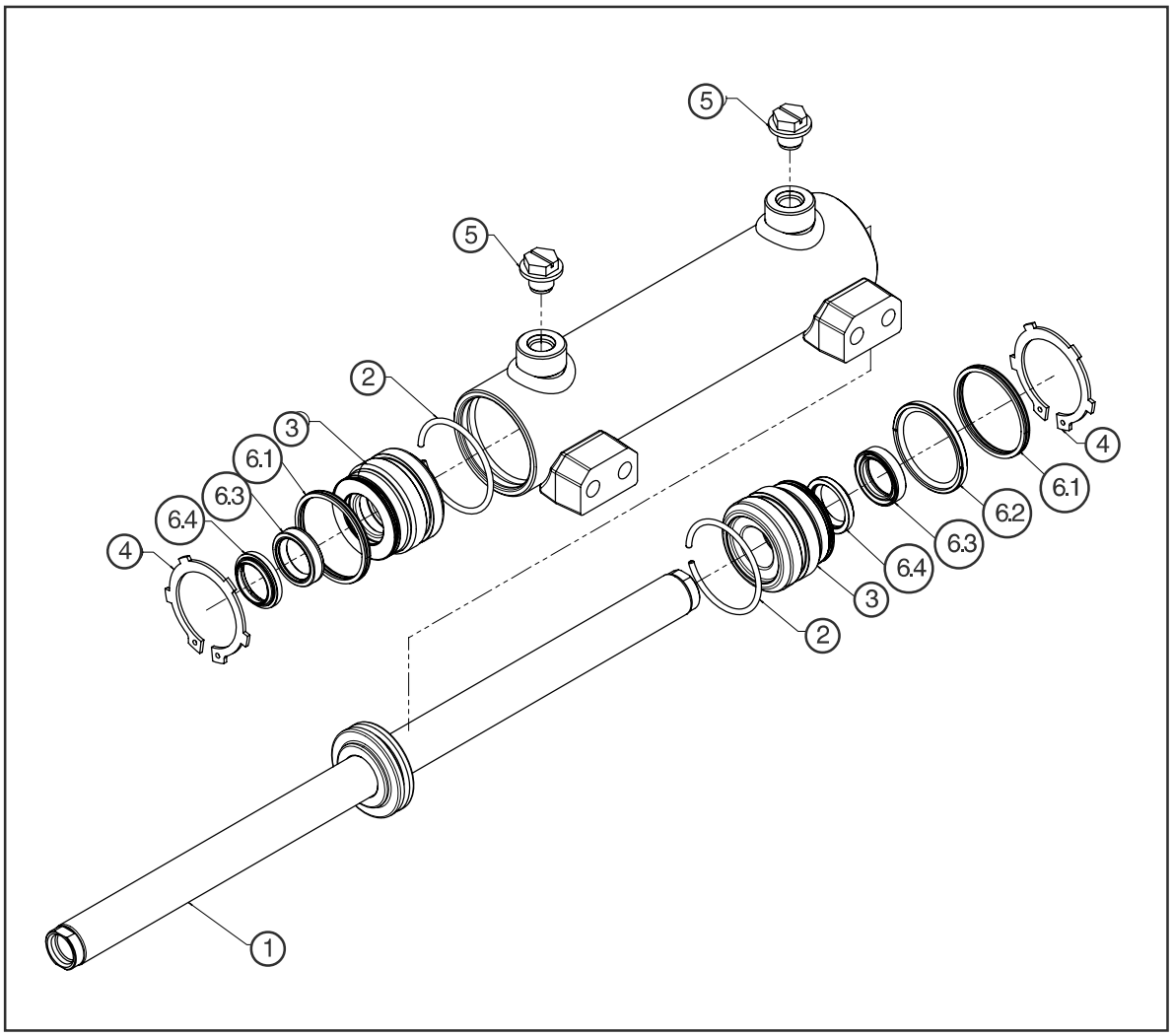


Fig 64 a (Steering cylinder exploded view)

1. Assembled rod
2. Retaining ring
3. Head
4. Seeger ring
5. Cap

6.1 Static seal
6.2 'O' ring
6.3 Rod wiper seal
6.4 Rod seal

7B - 17 Steering cylinder

Overhauling (OGNIBENE MAKE)

Special tools:

SER / 352	-	Cylinder gland assembly tool.
SER / 353	-	Rod mounting bell
SER / 354	-	Rod seal mounting bell.
SER / 355	-	Piston seal pusher tool.
SER / 356	-	Piston seal calibration tool.

Removal

1. Fix the cylinder in the vice with aluminum jaws or such aluminum protection on jaws.
2. Keep the rod at the end of stroke, you will work on one side first and on other side after that.
3. Fix the body taking care to avoid scratches on the surface.
4. Remove the external seeger with the piler at the first side of operation.

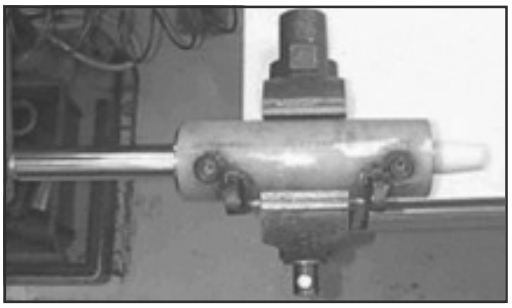


Fig 65

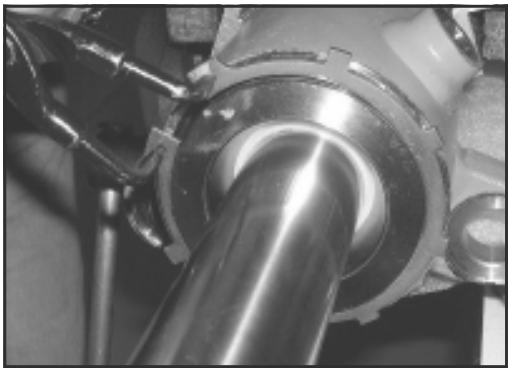


Fig 66

5. Keep the gland assembly tool SER / 352 on the first gland.
6. Use the plastic hammer to tap the gland assembly tool and push the gland inside the housing for approx 20/30 mm.

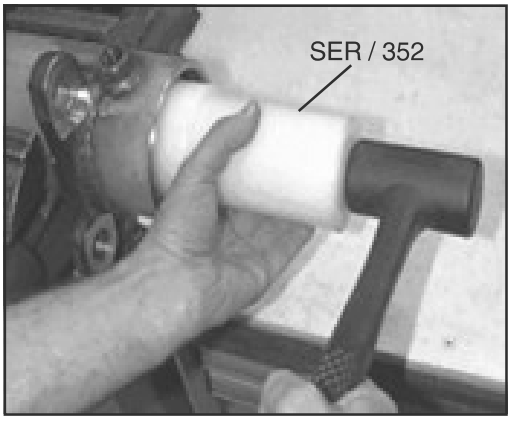


Fig 67

7. Use the flat screw driver straight to remove the internal snap ring from the housing.

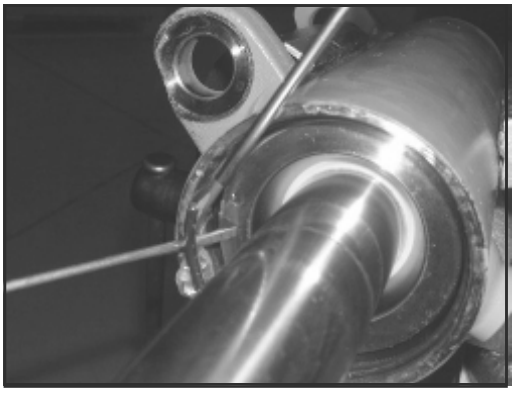


Fig 68

8. Take the rod tool and screw it on the rod.
9. Push the rod with the hammer from the side and let the first gland come out from the other side.

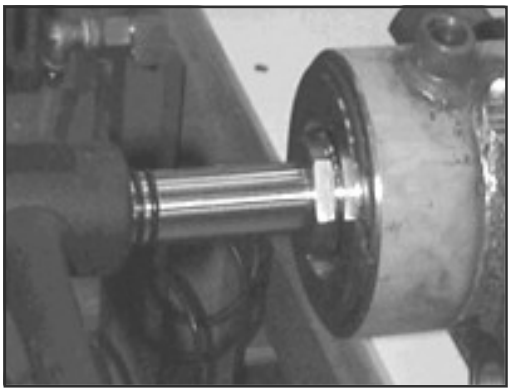


Fig 69

10. Remove the rod (pull it). Have no fear of damaging seals and guide rings, because they shall be replaced any how.

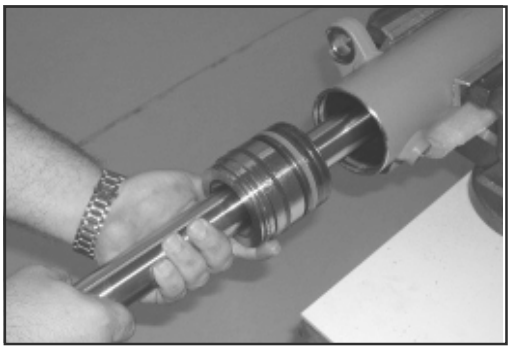


Fig 70

11. Use the pilers to remove the external seeger at the other side of body.

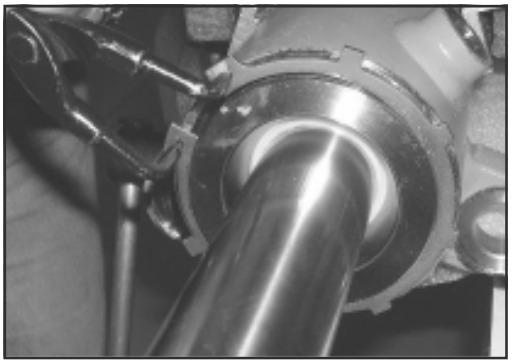


Fig 71

12. Mate the gland assembly tool SER / 352 on the gland. Use the plastic hammer to tap the gland and drive it inside the body for 20 / 30 mm.

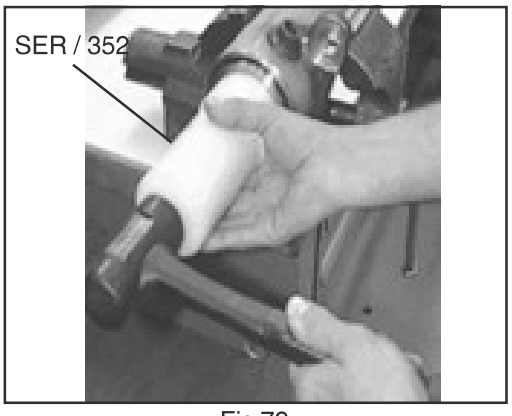


Fig 72

13. Use the flat screw driver straight to remove the internal snap ring from the housing.

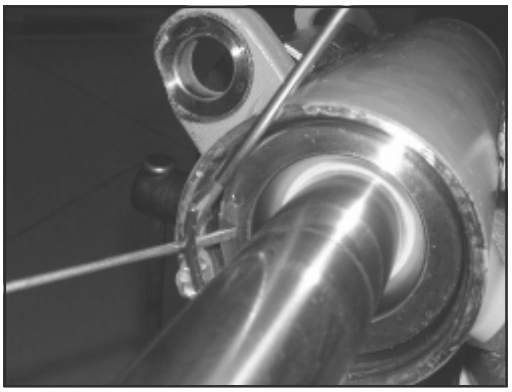


Fig 73

14. The piston and the two glands disassembled from the cylinder shall be separately resealed. Use the screw drive to remove the seal and the 'O' ring from the piston.

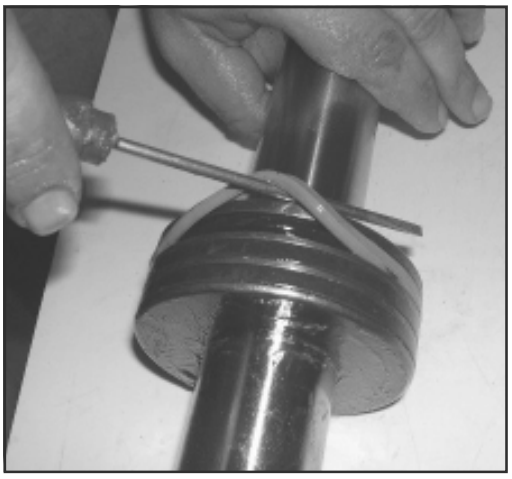


Fig 74

Seal replacement

15. Scrap used seal and open the seal kit. Clean the piston. Apply piston seal mounting bell SER / 354 next to the piston and insert the 'O' ring, having it slipping on the bell.

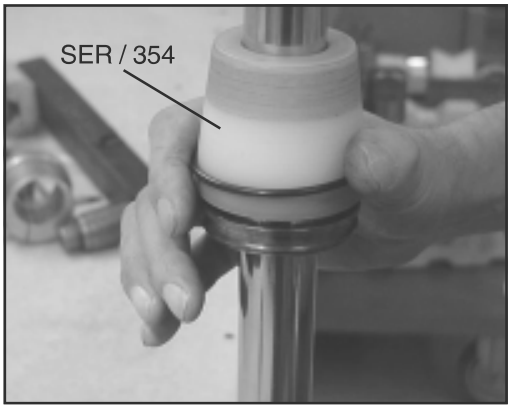


Fig 75

16. Insert the external ring of the piston seal over the 'O' ring mounted. Position the pushing tool SER / 355 over the bell, take the pushing tool and overlap the piston with it. The seal will fits its groove automatically.

Fig 76

17. Resize the seal with the calibration tool SER / 356.

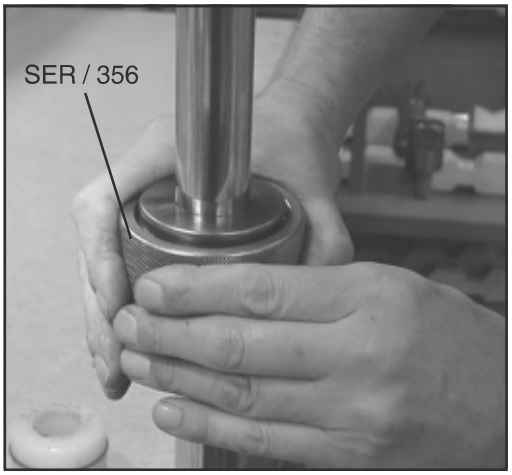


Fig 77

18. Remove the seals from the gland with the screw driver. Use the screw driver with care avoid any scratch on seal grooves.

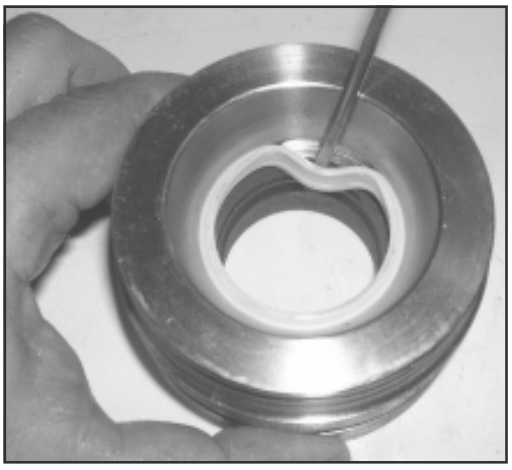


Fig 78

19. Remove the rod seal with the screw driver. Be sure to avoid scratches of the grooves.

Fig 79

20. Remove the external static seal paying attention not to scratch the groove surface.

Fig 80

21. Carefully wash the glands and check if any gross material is left, before assembly of new seals , residual materials could damage the inner surfaces of the cylinder.

Fig 81

22. Assemble the rod seal.

Note : *Mind the orientation of the lips. The seal lips shall be orientated to the oil pressure (Inner side of the cylinder).*

Fig 82

23. Use the screw driver to let the rod seal fit into the its groove. Avoid to make damage on rod seal.

Fig 83

24. Assemble the rod wiper manually.

Fig 84

25. Manually assemble the static seal over the glands.

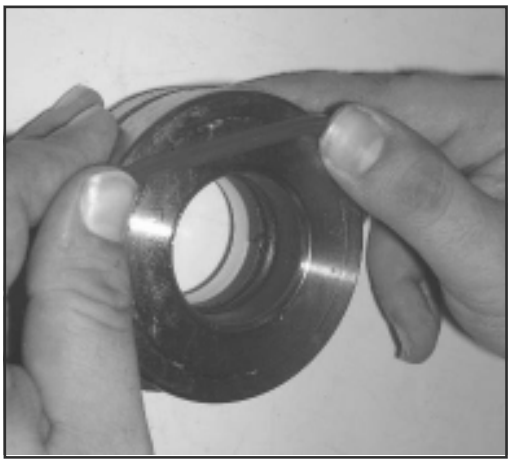


Fig 85

Reassembly

26. Place one of the glands at one side of the housing, put a plastic bell next to it and hammer to make it enter by about 20/30 mm in to the tube.

Fig 86

27. Manually insert the snap ring into the cavity.

Fig 87

28. Screw the bell SER / 353 on the rod and slide it into the housing. Keep on sliding the piston / rod assembly, until it reaches the gland already assembled on the opposite side.

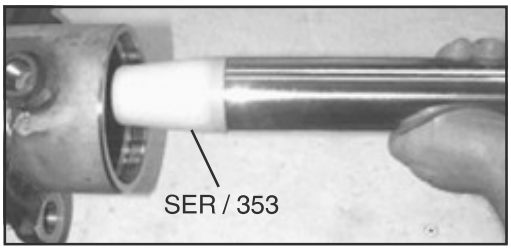


Fig 88

29. Use the hammer to completely push the piston / rod assembly inside the body , until it comes to a stop when piston hits the gland assemble yet. Be careful not to damage the piston seal.

Fig 89

30. Unscrew the bell SER / 353 and screw it at the opposite side of the rod.

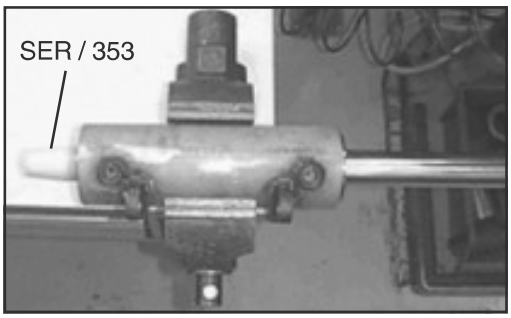


Fig 90

31. Manually insert the second gland in the body.

Fig 91

32. Use the hammer and the bell to push the gland inside the body by about 20/30 mm.

Fig 92

33. Place the snap ring on the gland.

Fig 93

34. Use the pliers to assemble the seeger ring on the first gland. Use the hammer to completely push the piston/rod assembly inside the body, until it comes to a stop when piston hits the opposite gland.

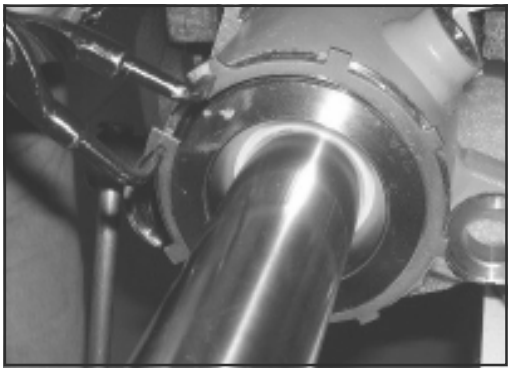


Fig 94

35. Assemble the seeger on the second gland. Now the cylinder is ready for usage

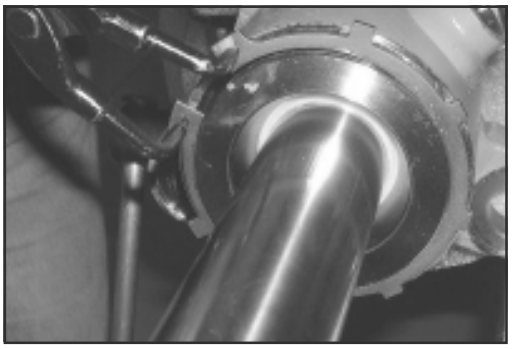


Fig 95

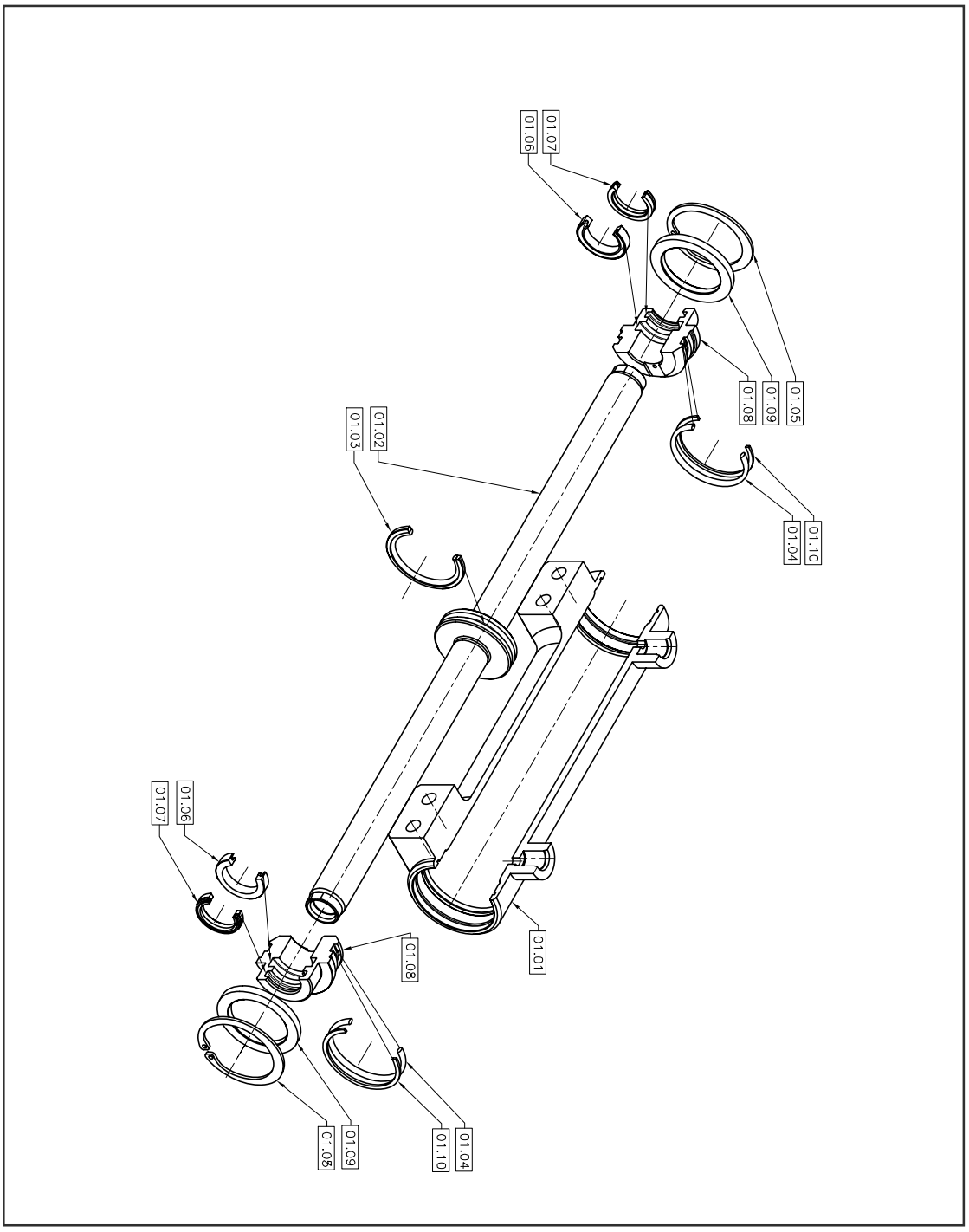


Fig 96 (Steering Cylinder exploded view)

01.01	Cylinder body	01.06	Rod seal
01.02	Piston rod	01.07	Wiper
01.03	Piston seal	01.08	End cover
01.04	O ring	01.09	Metal ring
01.05	Internal circlip	01.10	Back up ring

7B - 18 Steering cylinder.

Overhaul (Poly hydron Make)

Special Tools:

SER 357 - Piston seal pusher

SER 358 - Piston seal loader

SER 359 - Piston seal resizer

Dis-assembly

1. Remove the steering ram from the tractor.
2. Remove any sealing plugs and drain out any oil in the ram cylinder by moving the piston from one end of the cylinder to the other. Hold the cylinder over a container during this operation.
3. Hold the ram cylinder in a table vice as shown in the fig 97.
4. Remove the circlip by using the standard circlip plier at both ends from the cylinder body.
5. Withdraw the piston assembly from the cylinder body with either left or right end cover.
6. Remove the other end cover.

Examination

Clean and inspect all parts, renew any that are worn or damaged. Renew all seals, wear rings and 'O' rings.

SEAL REPLACEMENT PROCEDURE:

7. Cut the piston seal and remove .

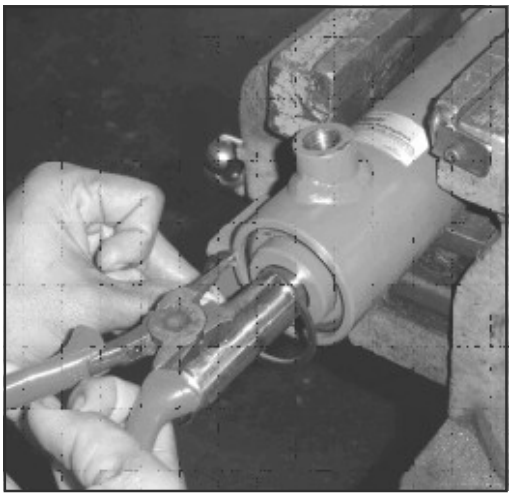


Fig 97

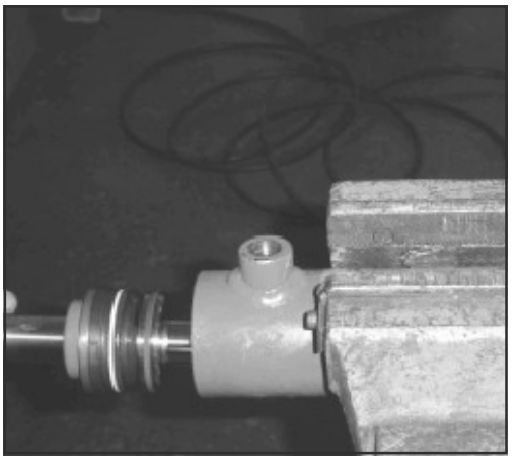


Fig 98

Fig 99

8. Remove the elastomer ring.

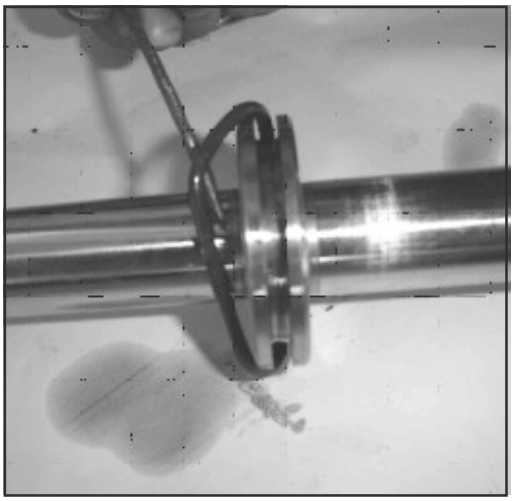


Fig 100

9. Remove the wiper seal.

Fig 101

10. Remove the rod seal .

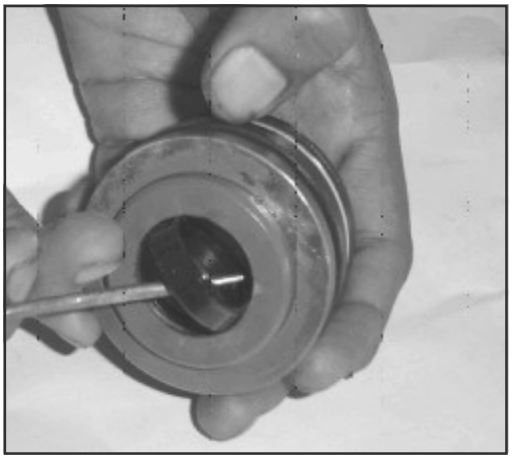


Fig 102

11. Remove the back up ring and ‘O’ ring.

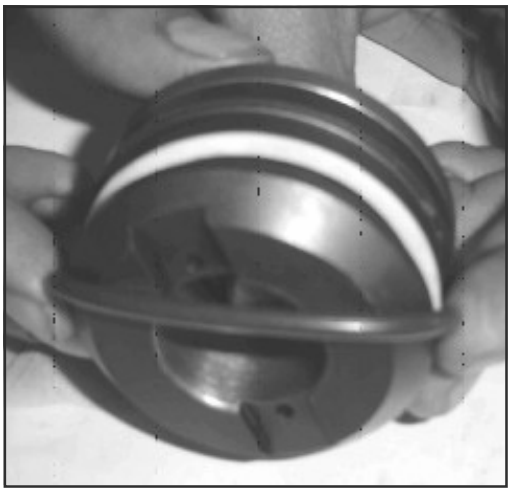


Fig 103

Replacement:

12. Fit a new set of rod seals in Both the end covers.

NOTE: Grooved face of rod seal always facing towards the piston seal side.

Fig 104

13. Fit a new set of back up ring and ‘O’ ring in Both the end covers.

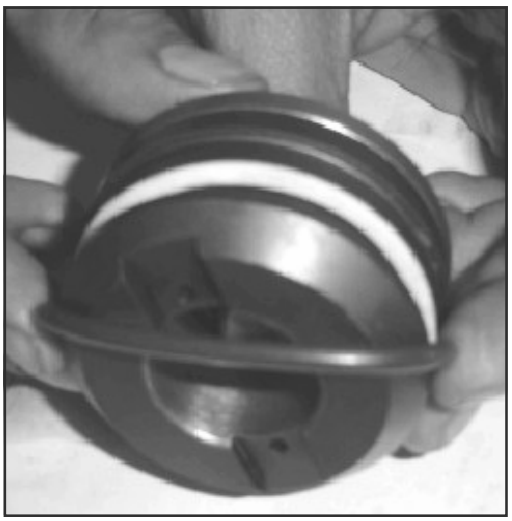


Fig 105

14. Renew the elastomer ring on the piston and lubricate.

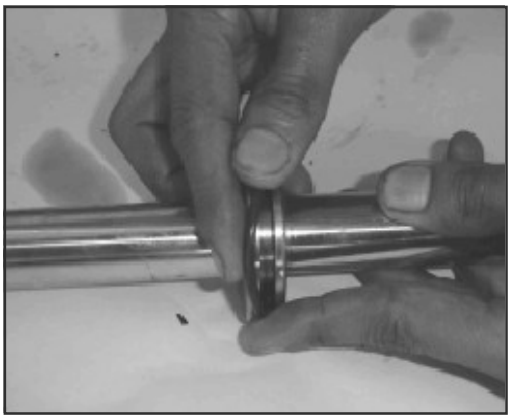


Fig 106

15. Expand piston seal by using SER / 357 pusher and SER / 358 loader

Fig 107

16. Renew the piston seal on the piston and lubricate

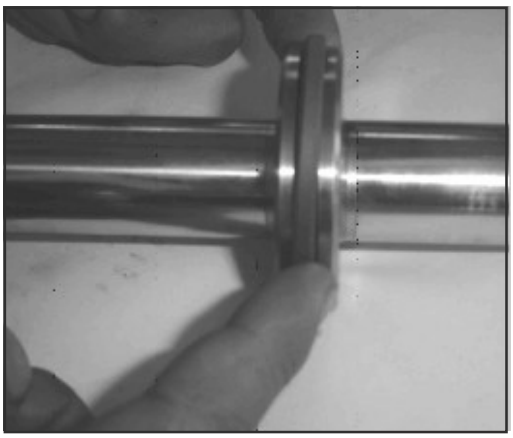


Fig 108

17. Insert the piston with seal into the SER / 359 piston seal resizer to resize the piston seal.

Fig 109

18. Insert a end cover into the piston rod and insert the assembly into the cylinder body.

ASSEMBLY:

19. Refit the end cover.
20. Refit the circlip
21. Refit the steering ram to the tractor.

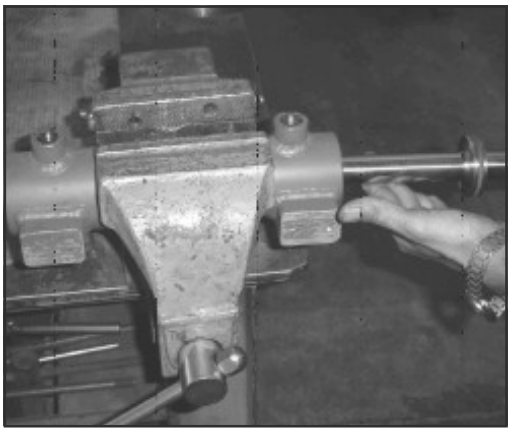


Fig 110

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